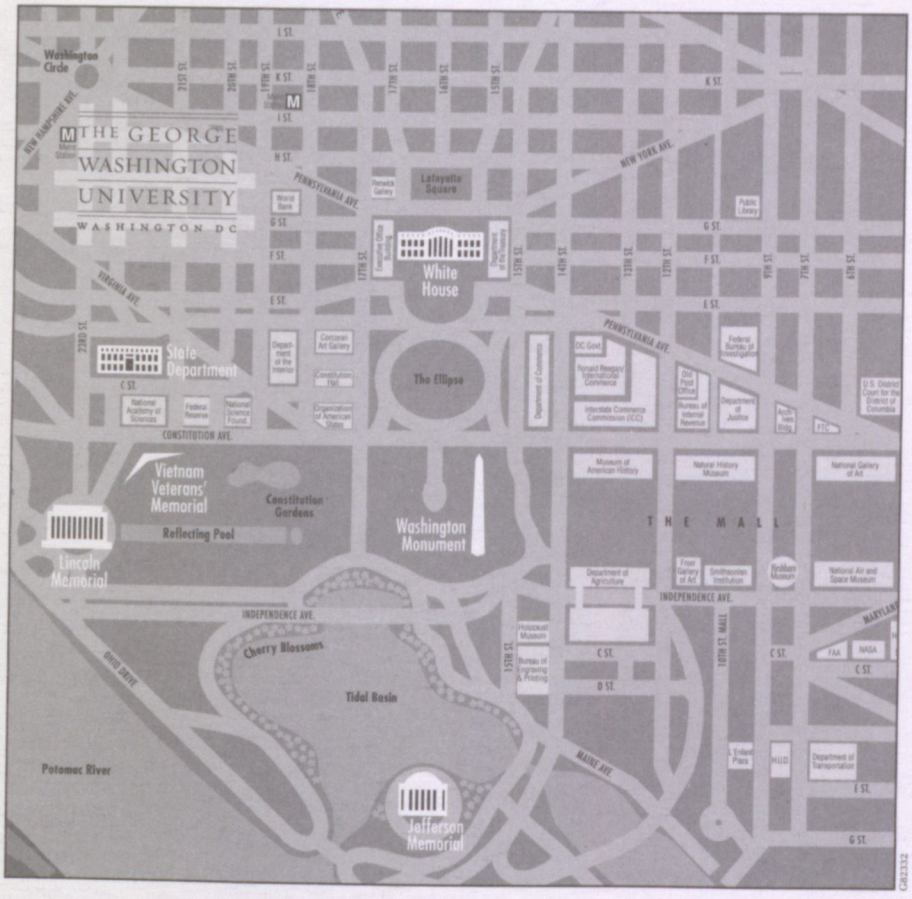
HE GEORGE WASHINGTON UNIVERSITY BULLETIN

UNDERGRADUATE PROGRAMS
2005–2006


THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON DC
White House
State Department
The Ellipse
Vietnam Veterans' Memorial
Constitution Gardens
Reflecting Pool
Lincoln Memorial
Washington Monument
THE MALL
Cherry Blossoms
Tidal Basin
Potomac River
Jefferson Memorial
Washington Circle
Lafayette Square
Corcoran Art Gallery
Museum of American History
Natural History Museum
National Gallery of Art
National Air and Space Museum
Department of Agriculture
Department of Transportation
Department of Justice
Department of Commerce
Federal Bureau of Investigation
Internal Revenue
Holocaust Museum
Bureau of Engraving & Printing
Smithsonian Institution
Ronald Reagan International Trade Center
Interstate Commerce Commission (ICC)
U.S. District Court for the District of Columbia
Federal Reserve
National Academy of Sciences
National Science Found.
Organization of American States
Constitution Hall
Department of the Interior
World Bank
Renwick Gallery
Decatur House
Department of Treasury
Old Post Office
Public Library
Arch. Hist. Bldg.
Smithsonian Institution
Freer Gallery of Art
Hirshhorn Museum
HUD
FAA
NASA
Ellipse
Maine Ave.
Ohio Drive
Virginia Ave.
New Hampshire Ave.
Pennsylvania Ave.
New York Ave.
Maryland
Independence Ave.
Constitution Ave.
C.R.2332

THE GEORGE WASHINGTON UNIVERSITY BULLETIN

UNDERGRADUATE PROGRAMS 2005–2006

Columbian College of Arts and Sciences

School of Business

School of Engineering and Applied Science

Elliott School of International Affairs

School of Public Health and Health Services

School of Medicine and Health Sciences

To e-mail an office at GW, see the online directory at www.gwu.edu. To write or call, address correspondence to the office concerned at The George Washington University, Washington, D.C. 20052; telephone (202) 994-1000. A brief directory appears on page 16 of this bulletin. The University publishes separate bulletins for Graduate Programs, the Law School, and the School of Medicine and Health Sciences.

www.gwu.edu

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THE ACADEMIC CALENDAR 2005–2006

August 2005

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28	29	30	31			

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October 2005

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December 2005

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January 2006

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February 2006

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March 2006

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April 2006

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June 2006

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July 2006

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2005 Fall Semester

August 31 Classes begin
September 3–5 Labor Day weekend (holiday)
Aug. 31–Sept. 9 Late registration
October 1 Applications due for winter graduation
November 8 Registration for spring semester classes begins*
November 24–25 Thanksgiving holiday
December 7 Designated Monday
December 9 Last day of regular fall semester classes
December 10 Makeup classes
December 10–12 Reading period
December 13–21 Examination period

2006 Spring Semester

January 17 Classes begin
January 17–27 Late registration
February 1 Applications due for May graduation
February 20 George Washington's birthday observed (holiday)
March 13–17 Spring recess
March 23 Registration for fall semester classes begins*
May 2 Makeup classes
May 3 Designated Monday
Last day of regular spring semester classes
May 4–5 Reading period
May 8–16 Examination period
May 21 Commencement

*Registration dates are tentative; consult the *Schedule of Classes*.

The University

Presidents of the University

1821–1827	William Staughton
1828–1841	Stephen Chapin
1843–1854	Joel Smith Bacon
1855–1858	Joseph Getchell Binney
1859–1871	George Whitefield Samson
1871–1894	James Clarke Welling
1894–1895	Samuel Harrison Greene, *Acting*
1895–1900	Benaiah L. Whitman
1900–1902	Samuel Harrison Greene, *Acting*
1902–1910	Charles Willis Needham
1910–1918	Charles Herbert Stockton
1918–1921	William Miller Collier
1921–1923	Howard L. Hodgkins, *ad interim*
1923–1927	William Mather Lewis
1927–1959	Cloyd Heck Marvin
1959–1961	Oswald Symister Colclough, *Acting*
1961–1964	Thomas Henry Carroll
1964–1965	Oswald Symister Colclough, *Acting*
1965–1988	Lloyd Hartman Elliott
1988–	Stephen Joel Trachtenberg

ABOUT THE UNIVERSITY

George Washington was determined to have a great national university in the nation's capital. His hope was that students from all parts of the country would gain a first hand knowledge of the practice as well as the theory of republican government while being instructed in the arts and sciences. He bequeathed 50 shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." Despite Washington's intentions, The Potomac Company folded and Congress never extended a "fostering hand," so the University did not take shape until a group of Baptist clergymen led by Reverend Luther Rice took up the cause. They raised funds for the purchase of a site and petitioned Congress for a charter. Congress insisted on giving the institution a non-sectarian charter which stated "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

Columbian College, as it was originally named, took up residence on College Hill, a 46-acre tract between the present 14th and 15th Streets extending from Florida Avenue to Columbia Road. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University.

By 1918, the University had moved to the Foggy Bottom neighborhood—between 19th and 24th Streets, south of Pennsylvania Avenue—in the heart of Washington, D.C. The more than 90 buildings, including 14 residence halls, are situated on 43 acres bordered by the White House, the John F. Kennedy Center for the Performing Arts, the State Department, and the World Bank, as well as numerous federal agencies, national galleries and museums.

GW's Virginia Campus, initiated for graduate studies, research projects, and professional development programs, is located along the high-tech corridor on Route 7, just to the west of Route 28, in Loudoun County. In 1998, GW established The George Washington University at Mount Vernon College; the Mount Vernon Campus is on Foxhall Road in Northwest Washington.

Currently, the University's enrollments total more than 24,000, of which 10,500 are undergraduates, over 12,000 are graduate and professional students, and more than 1,000 are nondegree students. The students come from all 50 states and about 130 different countries.

Mission Statement

The George Washington University, an independent academic institution chartered by the Congress of the United States in 1821, dedicates itself to furthering human well-being. The University values a dynamic, student-focused community stimulated by cultural and intellectual diversity and built upon a foundation of integrity, creativity, and openness to the exploration of new ideas.

The George Washington University, centered in the national and international crossroads of Washington, D.C., commits itself to excellence in the creation, dissemination, and application of knowledge.

To promote the process of lifelong learning from both global and integrative perspectives, the University provides a stimulating intellectual environment for its diverse students and faculty. By fostering excellence in teaching, the University offers outstanding learning experiences for full-time and part-time students in undergraduate, graduate, and professional programs in Washington, D.C., the nation, and abroad. As a center for intellectual inquiry and research, the University emphasizes the linkage between basic and applied scholarship, insisting that the practical be grounded in knowledge and theory. The University acts

as a catalyst for creativity in the arts, the sciences, and the professions by encouraging interaction among its students, faculty, staff, alumni, and the communities it serves.

The George Washington University draws upon the rich array of resources from the National Capital Area to enhance its educational endeavors. In return, the University, through its students, faculty, staff, and alumni, contributes talent and knowledge to improve the quality of life in metropolitan Washington, D.C.

The Schools

The George Washington University includes nine academic units, as follows:

Columbian College of Arts and Sciences offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts, Master of Arts, Master of Fine Arts, Master of Forensic Sciences, Master of Public Administration, Master of Public Policy, Master of Science, Master of Philosophy, Doctor of Philosophy, and Doctor of Psychology.

The School of Medicine and Health Sciences offers programs leading to the degrees of Bachelor of Science in Health Sciences, Master of Science in Health Sciences, and Doctor of Medicine.

The Law School offers programs leading to the degrees of Juris Doctor, Master of Laws, and Doctor of Juridical Science.

The School of Engineering and Applied Science offers undergraduate programs leading to the degrees of Bachelor of Science and Bachelor of Arts. Graduate programs lead to the degrees of Master of Science, Master of Engineering Management, Engineer, Applied Scientist, and Doctor of Science.

The Graduate School of Education and Human Development offers programs leading to the degrees of Master of Arts in Education and Human Development, Master of Arts in Teaching, Master of Education, Education Specialist, and Doctor of Education.

The School of Business offers programs leading to the degrees of Bachelor of Accountancy, Bachelor of Business Administration, Master of Accountancy, Master of Business Administration, Master of Science in Finance, Master of Science in Information Systems Technology, Master of Science in Project Management, Master of Tourism Administration, and Doctor of Philosophy.

The Elliott School of International Affairs offers programs leading to the degrees of Bachelor of Arts, Master of Arts, Master of International Policy and Practice, and Master of International Studies.

The School of Public Health and Health Services offers programs leading to the degrees of Bachelor of Science, Master of Science, Master of Public Health, Master of Health Services Administration, Specialist in Health Services Administration, and Doctor of Public Health.

The College of Professional Studies has been authorized to offer programs leading to the degrees of Associate in Professional Studies, Bachelor of Professional Studies, and Master of Professional Studies.

Accreditation

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

The School of Medicine and Health Sciences has had continuous approval by its accrediting body, which is currently the Liaison Committee on Medical Edu-

cation, sponsored jointly by the American Medical Association and the Association of American Medical Colleges. The clinical laboratory science program is accredited by the National Accrediting Agency for Clinical Laboratory Science. The Commission on Accreditation of Allied Health Education Programs has accredited the programs in sonography and physician assistant in the School of Medicine and Health Sciences and the athletic training program in the School of Public Health and Health Services. The public health programs have full accreditation from the Council on Education for Public Health. The program in health services administration is accredited by the Accrediting Commission on Education for Health Services Administration.

All Bachelor of Science engineering curricula of the School of Engineering and Applied Science (excluding systems engineering) are accredited by the Engineering Accreditation Commission of ABET, Inc. The Bachelor of Science computer science curriculum is accredited by the Computing Accreditation Commission of ABET, Inc.

The Graduate School of Education and Human Development is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education for its eligible master's and doctoral degree programs; the master's programs in school and community counseling and the doctoral program in counseling are accredited by the Council for the Accreditation of Counseling and Related Educational Programs; the master's program in rehabilitation counseling is accredited by the Council on Rehabilitation Education.

The School of Business is a member of AACSB International–The Association to Advance Collegiate Schools of Business; the Association accredits its undergraduate and graduate business administration and accountancy programs. The programs in accountancy satisfy the educational requirements for the Certified Public Accountant and the Certified Management Accountant professional examinations.

The Elliott School of International Affairs is a member of the Association of Professional Schools of International Affairs.

In Columbian College of Arts and Sciences, the B.F.A. with a major in interior design is accredited by the Foundation for Interior Design Education Research. The Department of Chemistry is on the approved list of the American Chemical Society. The Department of Music is an accredited member of the National Association of Schools of Music. The Ph.D. program in clinical psychology in the Department of Psychology and the Psy.D. program in the Center for Professional Psychology are on the approved list of the American Psychological Association. The M.A. program in speech–language pathology is accredited by the Education and Training Board of the Boards of Examiners in Speech–Language Pathology and Audiology. The M.P.A. program is on the approved list of the National Association of Schools of Public Affairs and Administration.

The Board of Trustees of the University

The University is privately endowed and is governed by a Board of Trustees of which the President of the University is an *ex officio* member. Trustees who are GW alumni are indicated by an asterisk. Locations are indicated for trustees outside the Washington metropolitan area.

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*J. McDonald Williams, *Former Chairman, Trammell Crow Company*
*James O. Wright, *Retired Corporate Executive*
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Dorothy Shapiro, *President, J.B. and Maurice C. Shapiro Trust*

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Law School—*Interim Dean* Roger H. Trangsrud; *Senior Associate Deans* Thomas A. Morrison, Peter Raven-Hansen; *Associate Deans* Alfreda Robinson, Robert V. Stanek, Renee Y. DeVigne, Scott B. Pagel, Jeffrey Gutman, Carol Izumi, Susan Karamanian, Ira C. Lupu
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College of Professional Studies—*Dean* Roger Whitaker; *Associate Deans* Ali Eskandarian, Mary Virginia Smith

The Faculty Senate

In addition to the elected members listed below, the President of the University is *ex officio;* the Vice President for Academic Affairs, the University Registrar, and the deans of the schools are administrative members; and a parliamentarian is selected by the Faculty Senate. In general, only primary appointments are listed below.

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Isabel Rodriguez Vergara, *Associate Professor of Spanish*
Harry S. Watson, *Professor of Economics*
Philip William Wirtz, *Professor of Management Science and Psychology*

Directory of University Offices

General Information (202)994-4949

Administrative Offices (all street addresses are Northwest Washington)

President	Rice Hall 802	(202)994-6500
Board of Trustees	Rice Hall 801	(202)994-8610
Executive Vice President for Academic Affairs	Rice Hall 813	(202)994-6510
Executive Vice President and Treasurer	Rice Hall 701	(202)994-6600
Provost and Vice President for Health Affairs	Ross Hall 713	(202)994-4356
Senior Vice President for Student and Academic Support Services	Rice Hall 402	(202)994-7210
Vice President for Advancement	2129 I Street	(202)994-6415
Vice President for Communications	Rice Hall 504	(202)994-8810
Vice President and General Counsel	2100 Penn Ave, #250	(202)994-6503
Columbian College of Arts and Sciences	Phillips Hall 107	(202)994-6210
School of Business	Hall of Government 206	(202)994-6380
Graduate School of Education and Human Development	2134 G Street	(202)994-6160
School of Engineering and Applied Science	Tompkins Hall 110	(202)994-6080
Elliott School of International Affairs	1957 E Street	(202)994-6240
Law School	Lerner Hall 102	(202)994-6288
School of Medicine and Health Sciences	Ross Hall 713	(202)994-3506
School of Public Health and Health Services	Ross Hall 125	(202)994-5179
College of Professional Studies	805 21st Street	(202)994-2083

Student Services Offices

Career Center	1922 F Street	(202)994-6495
Community Living and Learning Center	Fulbright Hall 104	(202)994-8345
Counseling Center	2033 K Street, #330	(202)994-5300
Dean of Students	Rice Hall 401	(202)994-6710
Disability Support Services	Marvin Center 436	(202)994-8250
Gelman Library	2130 H Street	(202)994-6845
Graduate Student Assistantships and Fellowships	Rice Hall 602	(202)994-6822
Graduate Student Enrollment Management	Rice Hall 603	(202)994-5984
GW Bookstore	Marvin Center	(202)994-6870
Information Technology Services	Rome Hall B101	(202)994-5530
International Services	2127 G Street	(202)994-6860
Mount Vernon Campus	2100 Foxhall Road	(202)242-6602
Office of University Students	812 20th Street	(202)994-1972
Special Academic Programs	812 20th Street	(202)994-6360
Student Accounts Services	Rome Hall 102	(202)994-7350
Student Activities Center	Marvin Center 427	(202)994-6555
Student Financial Assistance	Rice Hall 310	(202)994-6620
Undergraduate Admissions	Rice Hall 201	(202)994-6040
University Honors Program	2138 G Street	(202)994-6816
University Registrar	Rice Hall 101	(202)994-4900
Virginia Campus	Ashburn, VA	(703)729-8200

ADMISSIONS

The University reviews applications for admission each semester and summer session. Admission is based on evidence of potential for successful study and on available space in the entering class. The following criteria are considered: the strength of the courses taken and the grades achieved in secondary school and/or college, standardized test scores, relationship between grades and test scores, essays, recommendations, and extracurricular activities.

The application for admission to degree candidacy has two parts. The Application: Part I enables the student to create an application file and asks for biographical information. The Application: Part 2 asks for additional information and provides the essay questions. Applicants may download a printable version of both parts of the application from www.gwu.edu or may apply directly by using the online application. The nonrefundable fee is $60 for the online application or $70 for an application submitted on paper.

Secondary School Students

Freshmen—Regular Decision

Preference for places in the entering class will be given to students who submit the Application: Part 1 by December 1 and Part 2 with required credentials by January 15. Students who wish to begin college in the spring semester should submit Part 1 of the application by October 1 and Part 2 by November 1.

Applicants from secondary schools must arrange to have sent directly from their schools to the Office of Admissions a complete academic record together with a teacher recommendation and a counselor recommendation. This information should be supplied on the appropriate forms in the application packet. Before enrolling, incoming freshmen must provide a complete high school record showing final grades and graduation.

Entrance Examinations—Applicants from secondary schools must submit scores on the College Board Scholastic Assessment Test (SAT I) or on the American College Testing (ACT) battery. Submission of scores on College Board SAT II in writing and mathematics is recommended. Score reports must be sent directly to the Office of Admissions from the testing agency.

Freshmen—Early Decision I

High school seniors applying for fall admission as full-time freshmen with The George Washington University as their first choice may wish to take advantage of the Early Decision I option. To apply for Early Decision I, submit the Application: Part 1 by October 15 and Part 2 with supporting credentials by November 15; we will mail our decision in mid-December. If accepted, you are required to send in your declaration of intent to attend GW, together with appropriate nonrefundable deposits, no later than January 15 and to withdraw all applications for admission to other colleges and universities.

Freshmen—Early Decision II

If you decide after our Early Decision I deadline that GW is your first choice, our Early Decision II option may be best for you. To apply for Early Decision II, submit the Application: Part 1 by December 1 and Part 2 with supporting credentials by January 15. We will mail our decision in early February. If accepted, you are required to send in your declaration of intent to attend GW, together with appropriate nonrefundable deposits, no later than March 1 and to withdraw all applications for admission to other colleges and universities.

Freshmen—Early Admission for High School Juniors

Exceptionally well-prepared students who will complete the junior year in high school may apply for early admission. This option is designed for students with the emotional maturity, as well as the academic ability and background, necessary for college entrance. In most cases, applicants accepted for early admission have exhausted academic offerings in secondary school to the extent that remaining for the senior year may not be in the best interests of the students.

To be considered for early admission, students must

1. demonstrate superior academic performance through the junior year of high school;
2. meet the entrance requirements of the GW school applied to, by completing all required entrance units with the possible exception of the fourth year of English;
3. have the unqualified recommendation of the secondary school principal or counselor;
4. submit two letters of recommendation (in addition to the counselor's) from teachers who can testify to the student's maturity and general readiness to enter college;
5. submit a letter from a parent or guardian supporting early college entrance;
6. take SAT I or ACT plus SAT II subject tests in writing and mathematics and one other SAT II subject test (of the student's choice) and arrange to have the scores sent directly to the Office of Admissions by the testing agency;
7. arrange for an interview with an admissions officer.

Students from Foreign Institutions

Applications, required records, and scores on the Test of English as a Foreign Language (see below) and SAT I should be received from international students no later than January 15 for regular decision for the fall semester and October 1 for the spring semester.

Required Records—At the time the application is sent, students must have the educational institutions previously attended send directly to the GW Office of Admissions copies of official certificates and records listing subjects studied, grades received, examinations taken, and degrees received. Certified copies of diplomas and certificates from all secondary schools, colleges, and universities attended are required. Records of state examinations and certificates are also required. These records become the property of the University and cannot be returned. These documents should be in the language in which the institution keeps its official records. If they are in a language other than English, the copies sent should be accompanied by a certified English translation.

Language Tests—All applicants whose first language is not English are required to take the Test of English as a Foreign Language (TOEFL). In considering candidates for admission, the University looks for a TOEFL score of 550 or above (paper-based) or 213 or above (computer-based). The School of Business requires a minimum score of 600 (paper-based) or 250 (computer-based) on a second taking of the TOEFL. Applicants are responsible for making arrangements to take the test at www.TOEFL.org. The completed registration form must be returned well in advance of the semester for which admission is sought. TOEFL scores may not be more than two years old. On the application for the TOEFL, students should specify that the scores be sent to the GW Office of Admissions.

Admitted students whose first language is not English are also required to take an English as a Foreign Language placement test prior to registering at the University; the placement test is waived for students with a TOEFL score of at least 600 (paper-based) or 250 (computer-based). Depending on the results of this test, the student's academic program may be restricted in number and type of courses that can be taken.

Financial Certificate—A Financial Certificate and Bank Letter must be completed and submitted with the application for admission of all international students planning to study at the University under the authorization of either a student (F) or exchange visitor (J) visa. Satisfactory completion and submission of the Financial Certificate and Bank Letter are required for the issuance of a Form I-20 or DS-2019.

Readmission

Previously registered students who wish to resume studies on campus after discontinuing enrollment for one or more semesters (summer sessions excluded) must apply for readmission. Deadlines for readmission applications from students in good academic standing are the same as those for transfer students. Students seeking readmission after having attended other institutions of higher education in the interim must have complete official transcripts sent to the Office of Admissions from all other institutions attended. Students seeking readmission as degree candidates after previous enrollment in nondegree status must submit a standard undergraduate degree application and fee, together with all entrance credentials not previously received or required.

Applicants for readmission are subject to the University regulations in effect at the time of readmission.

The application fee is waived for students applying for readmission after previous enrollment as degree candidates at this University if they have not since registered at another institution.

Transfer Students

To be considered for fall admission, undergraduate students from other institutions should submit the Application: Part 1 by April 1 and Part 2 with required credentials by May 1. Corresponding dates for spring are October 1 and November 1; for summer, March 1 and April 1.

A transfer applicant should be in good standing as to scholarship and conduct at all postsecondary institutions previously attended. An applicant who has attended one or more institutions of higher education must request each registrar to mail directly to the Office of Admissions a transcript of his or her record, even if credits were not earned or if advanced standing is not desired. In addition, an applicant must have his or her high school record and College Board or ACT test scores sent to the Office of Admissions directly from the high school and testing agency.

Policies on Assignment of Credit for Transfer Students

Where there is no duplication involved, either through course work or examination, credit may be granted for work successfully completed at other institutions of higher learning. Assignment of transfer credit will depend on the grade earned, the appropriateness of the courses completed elsewhere, the standing of the institution at which the previous work was completed, and the regulations of the school of this University in which the credit is to be applied toward a degree. Transfer credit must satisfy the requirements for the degree sought as stated in this Bulletin. Credit may be accepted provisionally or may require validation by examination or completion of higher-level courses in the same sequence. Transfer credit will not be assigned for course work completed in vocational/technical programs (e.g., secretarial studies) or sub-freshman-level remedial work. Each school reserves the right to refuse credit for transfer in whole or in part or to accept credit provisionally. Although a grade of *D* in a course is not acceptable for transfer, the course may satisfy a curriculum requirement; credits earned with a grade of *D* will not, however, be assigned as ad-

vanced standing. Students who wish to transfer from one degree-granting school of the University to another must be in good academic standing and submit a formal application to transfer to the Office of Admissions. A maximum of 45 credit hours earned as a nondegree student in the Office of University Students may be applied toward degree requirements in a degree-granting school of the University. All transfer students must satisfy the residence and course requirements for degrees sought at this University. Additional school-specific regulations on transfer credit follow; any questions should be addressed to the school concerned.

Columbian College of Arts and Sciences—A maximum of 18 credit hours of professional courses completed at another institution will be assigned toward a degree in Columbian College. No more than 66 hours of credit earned at a two-year college may be applied as advanced standing toward a degree. Students wishing to transfer from another division of the University into a degree program in Columbian College must have a cumulative grade-point average above 2.0 at the time of their last completed semester before transfer.

School of Business—No more than 60 credit hours of advanced standing are granted for course work completed at a two-year college. Certain business courses taken at a two-year college (one per area up to a maximum of three courses) comparable to this School's courses numbered 101–200 may be accepted for credit only after BAdm 197 is successfully completed with a grade of *C* or better in the senior year.

A course completed with a grade of *D* or better may not be repeated for the purpose of earning degree credit. Exceptions to this rule are English composition, Math 31 or 51, and all accountancy courses. Any student earning a *D* in such courses at another institution may be required to repeat the courses at this University.

An international student who is required to take the English as a Foreign Language placement test and fails to pass it will be required to complete successfully the appropriate English composition course or courses, and the assignment of credit for any previously completed courses at another institution will be held pending completion of this requirement.

Students wishing to transfer from another division of the University must have a cumulative grade-point average of 2.8 or above at the time of transfer.

School of Engineering and Applied Science—Students should complete a Transfer of Credit worksheet, available in the SEAS Office of Admissions and Student Records, and present the worksheet to the faculty advisor for approval. A limited amount of credit may be assigned for selected service school courses.

Elliott School of International Affairs—No more than 66 credit hours earned at a two-year college may be applied as advanced standing toward a degree. Students wishing to transfer from another division of the University into a degree program in the Elliott School must have a cumulative grade-point average of 2.5 or above at the time of transfer.

School of Public Health and Health Services—Students apply directly to this school to enter upon completion of 30 credit hours with a minimum grade-point average of 2.25 for the athletic training major and upon completion of 60 credit hours with a minimum grade-point average of 3.0 for the public health major. Students applying to the exercise science major may enter this program either as freshmen or as transfer students with a minimum grade-point average of 2.0.

Enrollment Deposit

After notification of acceptance, an enrollment deposit will be required of all new full-time undergraduate students. This deposit is due May 1 for freshmen entering in the summer or fall semester; it is usually due two weeks after admis-

sion for transfer students. The deposit is credited toward tuition and orientation and is not refundable. Full-time readmitted students are required to submit an enrollment deposit that is usually due two weeks after admission.

Advanced Standing and Advanced Placement

Advanced Placement or Waiver by Examination

Advanced placement or waiver of a requirement will be granted on the basis of scores on the College Board SAT II subject tests according to the list that follows. Advanced standing (academic credit) is not assigned on the basis of SAT I or II or ACT results. Note that the University Writing requirements and Columbian College's General Curriculum Requirement in foreign languages and cultures are not waived on the basis of these tests.

Subject Test	Minimum Score	Exemption
American history	650	Waives Hist 71–72
French, Spanish	690	Waives a two-year language proficiency requirement
German, Latin	630	

Credit by Examination, from Service Schools, from Noncollegiate Organizations, and by Nontraditional Methods

Assuming there is no duplication of course work, a maximum of 30 credit hours may be assigned upon admission to the University for any combination of the following except as noted below.

College Board Advanced Placement (AP) Tests—On the basis of a score report sent to the Office of Admissions from the Educational Testing Service at the student's request, undergraduate credit is assigned for scores of four or five on most Advanced Placement Tests. Test scores below four are not accepted for assignment of academic credit. The Advanced Placement Tests are administered in the secondary schools in May of each year. Normally only students who complete a course designated as Advanced Placement are prepared for the examination. Students should arrange for the examination through the secondary school attended or with the College Board, Advanced Placement Tests, CN 6671, Princeton, N.J. 08541–6671.

College Board College-Level Examination Program (CLEP)—CLEP offers two types of examinations: General and Subject Examinations. CLEP General Examinations are offered in five areas: English composition, humanities, mathematics, natural sciences, and social sciences and history. CLEP Subject Examinations measure achievement in specific college-level courses and are offered in 32 subjects. Students should arrange for the examinations with the College Board, College-Level Examination Program, CN 6601, Princeton, N.J. 08541–6601.

With the exception of the English composition examination, for which no credit is given, credit is assigned for the General Examinations passed at approximately the 50th percentile or above. In the School of Business, credit is not assigned for the mathematics examination. In the School of Engineering and Applied Science, credit is not assigned for the mathematics or natural sciences examinations.

Credit is assigned, with some exceptions, for the Subject Examinations passed at the level recommended in the College Board model policy. Credit for the CLEP Subject Examinations may not be earned by passing the examination after having taken an equivalent college-level course. See the School of Business for specific restrictions on CLEP credit for applicants to that school.

Special Departmental Examinations for Undergraduates—Credit may be assigned for Special Departmental Examinations administered by Columbian College departments to students enrolled in all undergraduate divisions of the University.

International Baccalaureate—GW awards 6 to 8 credit hours for Higher-level scores of 6 and above with the exception of English language. Students who have passed English A1 with a grade of 6 or 7 will receive 3 credit hours for Literature. No credit will be assigned for English A2 or English B or for standard-level examination scores.

Credit Earned Through USAFI and DANTES—Except to students enrolled in the School of Business, credit is assigned for approved United States Armed Forces Institute (USAFI) and Defense Activity for Nontraditional Education Support (DANTES) courses.

Credit from Service Schools—Except to undergraduates admitted to the School of Business, a limited amount of credit may be assigned for selected service school courses.

Office of University Students

The Office of University Students makes on-campus credit courses available to nondegree, visiting students. Non-residents of the United States are required to apply to the Office of University Students. Applications can be obtained by contacting the Office of University Students at 202-994-1972 or through the website at www.gwu.edu/~ous. There is no application fee. For detailed entrance requirements, see the section on the Office of University Students under Other Programs and Services in this Bulletin.

FEES AND FINANCIAL REGULATIONS

The following fees and financial regulations were adopted for the academic year 2005–06. Information on tuition and fees for the summer is available at www.gwu.edu/summer.

Tuition Fees

For undergraduates entering GW in academic year 2005–06, the University has adopted a fixed-rate tuition plan, with the following academic-year tuition fees guaranteed not to increase for up to five years of full-time* undergraduate study: $36,370 for students entering Columbian College of Arts and Sciences (including its School of Media and Public Affairs), the School of Business, the School of Public Health and Health Services, the School of Engineering and Applied Science, and the Elliott School of International Affairs.

For undergraduates who entered GW in academic year 2004–05, the fixed-rate tuition remains in effect as previously stated: $34,000 for students in Columbian College of Arts and Sciences (excluding its School of Media and Public Affairs), the School of Business, and the School of Public Health and Health Services; $35,000 for students in the School of Media and Public Affairs, the School of Engineering and Applied Science, and the Elliott School of International Affairs.

The tuition rates that follow are set for academic year 2005–06, with the rates subject to annual increase, for all undergraduates who entered the University earlier than fall 2004. Excluding the School of Media and Public Affairs: $32,330 for

*A full-time program is defined as 12–17 credit hours per semester; a part-time program is fewer than 12 credits per semester. Undergraduates taking more than 17 credits per semester will be charged at the rate of 1 credit hour for each credit exceeding that limit. Undergraduates in the School of Engineering and Applied Science who are required to take 18 or 19 credits in some semesters will not be charged for the eighteenth and nineteenth credits.

students who entered fall 2003 or spring 2004; $32,030 for students who entered before fall 2003. In the School of Media and Public Affairs: students who entered fall 2003 or spring 2004, $33,330 for majors and $32,830 for minors; students who entered before fall 2003, $33,030 for majors and $32,530 for minors.

Part-time and nondegree students are charged $1,011 per credit hour except in the School of Media and Public Affairs, for which part-time students are charged $1,041 per credit hour.

Fees stated here exclude undergraduate programs in health sciences programs; consult the Office of Health Sciences Programs in the School of Medicine and Health Sciences for applicable fees.

Voluntary Library Fee—Each semester the Registration Schedule and Invoice includes a voluntary gift for the University libraries. Check the box labeled "Library Gift Decline" and omit the amount from your payment if you do not wish to include the library gift in your reimbursement to the University.

Note: Information on the fee structure for campus housing and meal plans appears on pages 33 and 34. Some courses carry additional fees, such as a laboratory or material fee, charged by semester as indicated in course descriptions and the Schedule of Classes. Students admitted to the B.A./J.D. program and the Seven-Year Integrated B.A./M.D. program pay a fixed net tuition rate annually; the amount is announced in the letter of admission.

Special Fees and Deposits (Nonrefundable)

Application fee (electronic)	$60
Application fee (paper)	70
Advance deposit, required of each entering or readmitted full-time undergraduate	800
Orientation fee, charged each entering full-time undergraduate	250
Student Association fee, per credit hour, to a maximum of $15 per semester	1
Late registration beginning the first day of the semester	80
Registration for continuous enrollment or leave of absence	35
Graduation fee	100
Late application for graduation (see Calendar)	35
Late payment fee (see Past Due Accounts, below)	75
Late authorization fee for third-party payment (see Third-Party Payment, below)	100
Returned check fee, charged a student whose check is improperly drafted, incomplete, or returned by the bank for any reason	35
Special Columbian College departmental examination to qualify for receiving credit (advanced standing), waiver of requirement, or both	100
Waiver examination to qualify for advanced placement	25
Engineers' Council fee (charged all SEAS students), per semester	8
English test for international students (when required)	20
Study abroad fee	300
Transcript fee	5
Replacement of lost or stolen picture identification card	25
Replacement of diploma	50

Payment of Fees

A student who registers for classes in any semester or session incurs a financial obligation to the University. Payment of tuition and fees is due upon receipt of the Schedule and Invoice or at the time of registration. Except for students on the monthly payment plan, tuition is to be paid in full by the first day of the semester or upon registration if registration is after the first day of the semester. The University reserves the right to revoke the registration, effective to the beginning of the semester, of any student who fails to make full payment. Students whose registrations have been revoked or canceled for failure to make

timely payments are not permitted to attend class and may not occupy University housing.

In addition to payment of tuition and fees, the University requires that a student confirm his or her registration. Students whose registrations are not confirmed by the third week of the semester may be canceled from all courses. Receipt of the tear-off portion of the Schedule and Invoice, typically mailed with the student's payment, is requested for confirmation of registration. All students whose registrations are not confirmed are notified in writing that their registrations will be canceled and are asked to contact the Student Accounts Office immediately. Charges for residence halls and meal plans are in accordance with license agreements signed by the student; questions concerning those charges should be referred to the Community Living and Learning Center or Business Services, respectively.

Monthly Payment Plan—This payment plan is open to all students and is available for the fall and spring semesters only. Students must complete and submit an application by August 15 for the academic year or by January 5 for the spring semester to participate in the plan. Upon approval of the application, the student will be billed for each payment. The monthly payment plan for the academic year begins in June and ends in March, with the first five payments applied to the fall account and the second five applied to spring. For spring semester only, the plan begins in November and ends in March. Under the plan, all payments are due on the first of each month. The student will receive a monthly bill, but no interest or late fees will be charged provided payments are received as scheduled. Students who enroll in the plan after the first month must make up all payments to the month of enrollment. Interest and a late payment fee are assessed all accounts not paid in full by October 5 for fall and March 5 for spring. An outside vendor administers the plan and charges a one-time participation fee in addition to interest and late fees for any payments received late. For more information, see www.gwu.edu/~sao/payment_plan.html.

Third-Party Payment—The University accepts employer vouchers or purchase orders that are not contingent upon receipt of grades. Under all circumstances, the charges for tuition and fees remain the responsibility of the student. Authorization from a sponsor to be billed for a student's charges must be received in the Student Accounts Office by the end of the third week of the fall or spring semester. A late authorization fee may be incurred for responses received after these times. Bills are mailed to sponsors in October for the fall semester and in February for the spring semester. Should a sponsor fail to remit payment to the University, the University will contact the student for payment. Students whose employers or sponsors reimburse them for tuition and fees after receipt of grades must pay in full upon receipt of the Schedule and Invoice or at the time of registration to avoid interest, late fees, and/or cancellation of registration. Students whose tuition is paid in full or part by employee benefits or teacher tuition remission must pay any remaining balance by the stated due date to avoid interest, late fees, and/or cancellation of registration.

Past Due Accounts—Accounts that are past due are encumbered by the University. A student whose account is encumbered may not register for future semesters and may not receive diplomas or transcripts. Late payment fees and interest may also be assessed each month that the account has an overdue outstanding balance. Please see the University's Tuition Payment Disclosure Statement at www.gwu.edu/~sao/disclosurestatement.pdf for more information on those fees and billing practices. Accounts that are more than 90 days past due are referred to an agency and/or attorney for collection. The student is then responsible for all charges, costs, and fees due to, or incurred by, the University as well as all costs, fees, and charges incurred by the agency and/or attorney, including attorney's fees. Students whose registrations have been revoked or

canceled for failure to make timely payments are not permitted to attend class and may not occupy University housing.

Dishonored/Returned Checks—A student whose check is returned unpaid by the bank for any reason will be charged a returned check fee and will be responsible for any associated costs and/or attorney's fees incurred by the University should a civil lawsuit or other collection effort be instituted to collect on such dishonored check. In any case where the University has reason to believe that a student presented a dishonored check in bad faith, the University may, in addition to any collection efforts, refer the matter to the proper authorities for criminal prosecution.

Withdrawals and Refunds

Applications for withdrawal from the University or from a course after the registration period must be made in accordance with procedures outlined under University Regulations in the sections Complete Withdrawal From the University, and Adding and Dropping Courses, respectively. Financial aid recipients must notify the Office of Student Financial Assistance in writing. No refund of the tuition deposit required of entering students is granted.

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule for the fall and spring semesters:

1. *Complete withdrawal from all courses (on-campus students)*:
   Withdrawal dated on or before the end of the first week of the semester 80%
   Withdrawal dated on or before the end of the second week of the semester ... 60%
   Withdrawal dated on or before the end of the third week of the semester 40%
   Withdrawal dated on or before the end of the fourth week of the semester 25%
   Withdrawal dated after the fourth week of the semester ..... None
2. *Partial withdrawal*: If the change in program results in a lower tuition charge, the refund schedule above applies to the difference.
3. Regulations governing student withdrawals as they relate to residence hall and food service charges are contained in the specific lease arrangements.
4. *Summer Sessions*: In cases of authorized withdrawals from courses, refunds of 75% of tuition and fees will be made for courses dropped within the first seven calendar days of the start of a session. No refund will be made for courses dropped thereafter.

Courses that do not follow the traditional semester may have different refund policies.

The above information regarding cancellation of tuition charges and fees after withdrawal from the University may not apply to entering students who are recipients of federal aid; those students should check with the Student Accounts Office for the applicable cancellation schedule.

Refund policies of the University are in conformity with guidelines for refunds as adopted by the American Council on Education. Federal regulations require that financial aid recipients use such refunds to repay financial aid received for that semester's attendance. This policy applies to institutional aid as well.

In no case will tuition be reduced or refunded because of absence from classes.

Authorization to withdraw and certification for work done will not be given a student who does not have a clear financial record.

FINANCIAL AID

The George Washington University offers a program of financial assistance for students. Undergraduate aid consists of two basic types: awards for academic achievement or talent without reference to financial circumstances (merit scholarships) and scholarships, grants, loans, and employment based on both academic achievement and demonstrated financial need. All undergraduate gift aid (institutional scholarships and grants and federal grants) requires that the recipient be working on the first undergraduate degree and be registered for a full-time course load on campus at GW. (Financial aid for study abroad is limited to approved programs; applicants must attend a session on financial aid for study abroad.) Loans and resident assistantships not based on financial need are available. In general, continuation of undergraduate aid does not extend beyond ten semesters, or the end of the senior year, or the number of credits sufficient to graduate, whichever comes first. (A non-GW study abroad semester counts as one of the ten semesters.)

Gift aid (scholarships, grants, fellowships, assistantships, etc.) is taxable to the extent that it exceeds the allowable costs of tuition, fees, and required books and supplies or is dedicated to other costs, such as room and board. Federal grants may be taxable if, together with other gift assistance, they exceed the allowable costs. In the case of a student who is awarded tuition scholarships, grants, or awards from more than one source, the combined amount cannot exceed tuition charges; institutional aid will be adjusted to this limit.

In general, consideration for financial aid is restricted to students in good academic standing who meet the minimum grade-point average for particular awards and are not financially encumbered by any other University office. Awards may be rescinded if satisfactory academic progress standards are not met. Applications for institutional or federal aid cannot be processed if the relevant tax returns have not been filed in accordance with the IRS Code. The University reserves the right to ask for documentation necessary to determine aid eligibility. Documents submitted as part of aid applications become the property of the University and cannot be returned. Federal regulations require that the University report suspected cases of fraud or misrepresentation to the appropriate federal, state, and local authorities.

Information in this section is accurate at the time this Bulletin is prepared for press. The Board of Trustees reserves the right to change financial aid policies as it deems necessary. Additional information is contained in the Financial Aid Sourcebook and the Satisfactory Academic Progress statement available on-line. Future changes in federal regulations or institutional policies may alter the application requirements or program guidelines.

Merit Aid

The University has merit aid programs of scholarships and awards for students with superior academic credentials or talents. These programs are based entirely on merit, without regard to financial need. Renewal is dependent on satisfactory academic progress relevant to the specific award in at least 15 credit hours per semester and the necessary grade-point average. Merit scholarships, including GW-sponsored National Merit Awards, cannot be combined.

Presidential Academic Scholarships—for incoming freshmen. Partial tuition scholarships are awarded to finalists in national academic competitions such as National Merit, National Hispanic Scholars, and National Achievement for Outstanding Negro Students. Members of Phi Theta Kappa or Alpha Beta Gamma who are transferring from community or junior colleges and have achieved grade-point averages of 3.7 and above in 56 transferrable hours will be considered for partial tuition awards. A GPA of 3.0 (*B*) on 15 earned credits per semester, exclusive of courses not counted toward graduation, is required for renewal of the Presidential Academic Scholarship if awarded prior to fall 2003. A GPA

of 3.2 on 15 earned credits per semester, exclusive of courses not counted toward graduation, is required for renewal of these scholarships awarded for fall 2003 and thereafter.

Merit scholarships are also available to students admitted to the seven-year integrated B.A./M.D. and the SEAS/M.D. program; offering a unique fixed-tuition plan, this arrangement allows families to plan and finance their student's undergraduate and medical education. These integrated programs require the same GPA requirements for renewal.

Presidential Arts Award—partial tuition awards for incoming freshmen who have shown promise in the fine arts and in music, theatre, or dance. A GPA of 3.0 (*B*) and the recommendation of the relevant department is required for renewal.

Presidential Recognition Award—a partial tuition award for students currently receiving a merit award who entered GW in fall 2003 and have completed at least 60 credit hours at GW (a minimum of at least 15 credits per semester, excluding summer term). Review for the scholarship is done in May, and the student must have at least a cumulative GPA of 3.8 for all course work at GW.

Elliott Engineering Honor Scholarships—$10,000 awards are offered to outstanding incoming SEAS students with 30 or more transferable credit hours and a minimum of 3 credits of college-level chemistry or physics and 6 credits of college-level calculus or higher math. Awards may be renewed by current recipients who maintain the required GPA of 3.2 in 15 credits per semester, provided the recipient is enrolled full time in an engineering curriculum.

The J.B. and Maurice C. Shapiro Scholarship to the University of Oxford is awarded each spring to a graduating senior or recent graduate through a competitive process upon the nominee's acceptance to Oxford. To be eligible, applicants must have applied for the Rhodes or British Marshall Scholarships. All of these competitions require high academic standing, evidence of leadership, and dedication to the larger society through community service. The Shapiro Scholarship provides up to two years of study at Oxford, equivalent to the Rhodes Scholarship. The J.B. and Maurice C. Shapiro Endowment funds two scholarships per year—one new and one renewal. The Shapiro Scholarship program began in 1992.

The Bender Scholarship to the University of Cambridge is funded by an endowment, the Bender Scholarship Fund. Every other year, the Bender Scholarship is open for competition. Graduating seniors, recent graduates, and third-year law students who participated in the Rhodes and/or British Marshall competitions are eligible for the Bender Scholarship. The endowed scholarship provides for up to two years of study at the University of Cambridge. The award provides for an educational experience equivalent to that of a British Marshall Scholar attending Cambridge. The Bender Scholarship criteria are high academic achievement, evidence of leadership skills or potential, and community service. The first GW Bender Scholar attended Cambridge in 1992.

Pembroke/GW Program—The George Washington University established a special relationship with Pembroke College in Oxford, whereby up to six GW juniors would be placed at the College for one year and enrolled as fully matriculated students of the University of Oxford. These placements are determined in an annual competition that takes place in the fall. The Committee evaluating candidates forwards to Pembroke College applications of the finalists. Pembroke then makes the final decision on placements. More than 30 GW students have spent a year at Oxford in this program.

Need-Based Aid

The University offers extensive programs of scholarships, grants, loans, and employment based upon demonstrated need. The University participates in the Federal Perkins Loan, Federal Pell Grant, Federal Supplemental Educational Opportunity Grant, Federal Family Education Loans, and the Federal Work–

Study program. All applicants are required to file both the PROFILE and the Free Application for Federal Student Aid (FAFSA), designating GW to receive their information, and to supply copies of signed federal income tax returns and W2 forms for the current tax year for student and parents (if dependent). For family members employed by an international organization, a letter is required from the employer certifying salary and all benefits. Continuing students also need to submit a GW Financial Aid Application.

Incoming freshmen must file applications and supporting credentials for financial aid by February 1 for the next academic year; transfer students, by April 1. Continuing students must file the PROFILE and FAFSA forms by April 22, and submit the GW Financial Aid Application for Continuing Undergraduate Students and supporting tax documents to the Office of Student Financial Assistance no later than April 22. March 1 is the deadline for the summer sessions. Summer aid is limited to federal or alternative loans. A student must reapply each year for all need-based aid, including need-based scholarships; renewal is contingent upon funds being available when the student completes the application.

The George Washington Guaranteed Grant—The GW Guaranteed Grant is available only to new undergraduate students entering in the fall 2004 term and thereafter who are charged full-time tuition according to the University's fixed-tuition initiative and who receive a need-based financial aid package for their initial period of enrollment at the University. This need-based grant will be part of a student's initial financial aid package and is guaranteed for up to 10 consecutive semesters of full-time undergraduate enrollment at GW. For renewal of the grant, the student must be enrolled and be charged as a full-time student and must maintain satisfactory academic progress per the guidelines of the Office of Student Financial Assistance. The award will be confirmed upon receipt and review of signed copies of the parents' and student's 2004 federal tax returns (with requested schedules) and W2 statements. Students showing additional need beyond the GW Guaranteed Grant will be considered for assistance from all other resources administered by the Office of Student Financial Assistance. While this grant can be combined with other institutional need-based grant awards, a student may not receive the GW Guaranteed Grant in combination with merit awards or GW employee benefits.

University Scholarships—Full and partial tuition scholarships begin in the fall semester and may be renewed through the senior year, provided the holder reapplies by the published deadlines, maintains a *B*− average or better, completes 15 credits per semester, and continues to demonstrate financial need. All applicants for need-based aid are considered for these awards.

Sherman Page Allen Memorial Scholarship Fund
Mary J. Anderson Scholarship
Byron Andrews Scholarship
D.F. and J.D. Antonelli Scholarship Fund
Athletic Scholarship Fund
Stanley M. Baer Scholarship in Electrical Engineering
Sigrid Weeks Benson Scholarship
Gail E. Boggs Engineering Scholarship
Bou Family Foundation Scholarship
Henry N. Brawner, Jr., Foundation Scholarship Fund
A.D. Britt Scholarship Fund
Frederick Albert and Alma Hand Britten Scholarships
Barbara Willmarth Callahan Scholarship Fund
Mary Ellen Caplin Scholarship
Elsie M. Carper Undergraduate Scholarship Fund
Emma K. Carr Scholarships
Henry Harding Carter Scholarship
Maria M. Carter Scholarship

Paul E. Casassa Memorial Foundation Scholarship
James Edward Miller Chapman Educational Foundation Scholarship
Columbian Women Scholarship Funds
  Victoria Briggs Scholarship Fund
  Elizabeth V. Brown Scholarship Fund
  Grace Ross Chamberlin Scholarship Fund
  College Women's Scholarship Fund
  Columbian Women Members' Scholarship Fund
  Arline Hughes Dufour Scholarship Fund
  Dr. Watson W. Eldridge, Jr., and John F. Eldridge Scholarship Fund
  Founders of Columbian Women Scholarship Fund
  Ross Lees Hardy Foundation Scholarship Fund
  Lillian Young Herron Scholarship Fund
  Nellie Maynard Knapp Scholarship Fund
  Marcia B. Kraft Scholarship Fund
  Janet McWilliams Scholarship Fund
  Marie-Louise Ralph Turner Scholarship Fund
Cora and John H. Davis Scholarship
Isaac Davis Scholarship
Bertha B. Day Scholarship in Civil Engineering
District of Columbia Daughters of the American Revolution Scholarship
Estella Constance Drane Scholarship
Henry Parsons Erwin Scholarship
Robert Farnham Scholarship
Esther Brigham Fisher Scholarship
Louis E. Giles Memorial Scholarships
Gary C. and Leslie Granoff Scholarship Fund
Gridiron Foundation of the Gridiron Club Scholarship
Gruss Scholarship Fund
Isadore and Bertha Gudelsky Family Scholarship
Theo Campbell Hartman Scholarship
Elma Lewis Harvey Scholarship
Hazelton Scholarship
Adele Melbourne Holmes Native American Scholarship
Albert A. and Esther C. Jones Scholarship Fund
Allen M. Jones Scholarship Fund
David B. and James L. Karrick, Jr., Scholarship Fund
Samuel and Elizabeth Kay Scholarships
Amos Kendall Scholarship
L. Poe Leggette Memorial Scholarship Established by WRGW
Thaddeus A. and Mary Jean Lindner Scholarship Fund
Calvin D. Linton Endowment Scholarship Fund
Mary and Daniel Loughran Scholarship
Martha's Marathon Residence Hall Scholarship
Marshall Memorial Scholarship Fund
Maud E. McPherson Scholarship
Mensh Family Scholarship
A. Morehouse Scholarship
E. K. Morris Education Fund Scholarships
Helen Marie and Thomas E. Orr Scholarships
Henry and Caroline Orth Scholarship Fund
Thornton Owen Scholarship
Phi Delta Gamma Scholarships
Fred B. and Alma D. Pletcher Scholarship Fund
Levin M. Powell Scholarships
Jack B. Sacks Foundation, Inc., Scholarship
Henry Whitefield Samson Scholarship Fund

Student Employment

The University participates in the Federal Work–Study Program. Inquiries should be addressed to the Office of Student Financial Assistance. Work–study job placement is handled by the Career Center. In addition, the Career Center maintains a registry of both full-time and part-time positions available in the Washington area for undergraduate and graduate students. After registration, students may apply at the Career Center for interviews and referrals to positions for which they are qualified.

International Students

Undergraduate international students with proven financial need who have completed two semesters of full-time work (30 credit hours) at this University with a *C* average are eligible to apply for University and Alumni Awards. Aid is awarded in the spring for the following academic year. See instructions for applying for undergraduate financial aid, above. For those not filing a U.S. tax return, a letter from the employer, certifying salary and benefits, is required.

The maximum award for an international student is $10,000 including any merit scholarship offered at the time of admission.

Students who wish to study in the United States should have sufficient funds available to cover expenses for one full year before attempting to enter a college or university. The cost at this University for one academic year (September–May) was $46,090 in 2004–05 and will be higher in 2005–06; generally speaking, expenses for international students are about $2,000 over the stated figure, which includes room and board, tuition, books, clothes, and incidental expenses, but not travel, holiday, or medical expenses.

Veterans Benefits

The Veterans Benefits office assists students entitled to educational benefits as active-duty personnel, veterans, or as widows or children of deceased or totally disabled veterans with any problems that may arise concerning their benefits. This office also processes certification of enrollment and attendance to the Veterans Administration so that educational allowances will be paid.

When feasible, students entitled to educational benefits as active-duty personnel, veterans, or dependents of veterans should consult with the veterans counselor prior to submitting applications to the Veterans Administration. All such students should obtain the instruction sheet issued by the veterans counselor; it sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration and includes other information of general interest. Eligible students should be aware they must be admitted to a degree seeking program by the start of their third semester in order to continue receiving veterans benefits.

STUDENT SERVICES

Office of the Dean of Students

The Office of the Dean of Students provides counseling and information for students, administers the nonacademic student disciplinary system and student grievance procedures, assists students in resolving complex issues, and supports nonacademic program development. Staff members are well informed on University policies and the various student services provided on campus, enabling them to provide referrals and answers to many questions concerning general student life. Personal letters of recommendation for students applying to graduate and professional schools can be obtained from this office. The Office of the Dean of Students oversees the Community Living and Learning Center.

Campus Housing

Complete information concerning the University's residence halls is available from the GW Community Living and Learning Center (CLLC). Its website address is gwired.gwu.edu/cllc. CLLC offers a diverse range of community living environments and co-curricular initiatives designed to promote student growth and development. Among the offices and services contained within CLLC are the areas of Housing Services, Student Judicial Services, and Summer Housing Services.

Admission to the University does not include a room reservation. The student will receive, with the notification of acceptance, University residence hall information, directions for completing an application for residence hall space or apartment accommodation, and a declaration of intent to attend the University.

Rooms and apartments are available for the academic year, with assignments on a first-come, first-served basis. Students in the residence halls must be registered full time in a degree program for at least 12 credit hours of academic course work during each of the fall and spring semesters. Seniors need not be enrolled for more credits than needed to graduate in their last semester, but they must receive a waiver from Housing Services for the final semester. Pursuant to an order of the District of Columbia Board of Zoning Adjustment, all freshman and sophomore students are required to reside in University housing. Exemptions are available for students who are married or have children, have disabilities or religious beliefs inconsistent with residence hall living environments, commute from outside of the Foggy Bottom/West End area, or have established permanent residency within the Foggy Bottom Campus/West End area. Guidelines on applying for an exemption from the University housing requirement are available at the Office of Housing Services or at gwired.gwu.edu/cllc/housing. A map identifying the boundaries of the Foggy Bottom/West End neighborhood is also shown at gwired.gwu.edu/cllc/housing. Early in the spring semester, eligible returning students submit an Intent-to-Return application to the Office of Housing Services to reserve space in a residence hall for the next academic year. The application must be submitted by the date indicated in correspondence to students and on the CLLC web site. Students under 18 years of age must receive the permission of their parent or guardian in writing before submitting the Intent-to-Return application. Housing charges appear on the student's Schedule and Invoice for each semester.

Charges for residence hall space are determined by hall, room size, and amenities, with the 2004–05 most prevalent cost set at $7,210 for the academic year. In the apartment halls the 2004–05 most prevalent charge per student is set at $8,800 for the academic year, with prices ranging higher and lower according to the space and amenities provided. Exact costs for the 2005–06 academic year will be announced.

GW Dining

All undergraduate students residing in on-campus housing are required to participate in a minimum nonrefundable Colonial Cash plan according to class standing (amounts listed are for the academic year): freshmen, $3,000; sophomores, $2,500; juniors, $2,000; seniors, $1,000. These plans are structured to provide convenience and flexibility in spending at a variety of locations and services. Full information regarding the Colonial Cash plans and all related policies is available on-line at gworld.gwu.edu.

Student Health Service

The Student Health Service is an outpatient clinic staffed by physicians, nurse practitioners, and physician assistants who can evaluate and treat most of students' medical problems. Visits should be arranged by appointment; urgent problems may be seen on a walk-in basis if necessary. Charges for visits, labwork, and medication apply. Psychiatric evaluation and short-term therapy appointments and crisis intervention are available. Health education and outreach programs on a variety of topics are provided throughout the year.

For serious emergencies occurring during hours when the Student Health Service is closed, students may go to the Emergency Room of the University Hospital for treatment. All fees are the responsibility of the student.

Students must be currently enrolled on campus in the University to receive treatment at the Student Health Service. Students enrolled in off-campus programs and continuing education programs are not eligible. Bills incurred both in and outside of the Student Health Service (for example, x-ray work, laboratory work, and office visits to private physicians) are the responsibility of the student. Additional information about the Student Health Service can be found at gwired.gwu.edu/shs.

Health and Accident Insurance

The University recommends that all students be covered by health and accident insurance. For information on health insurance offered through the University, contact the Chickering Group at 1-800-213-0579 or www.chickering.com.

Immunization Requirements

It is the law in the District of Columbia that all students under the age of 26 have a record on file with the Student Health Service documenting immunity to Measles, Mumps, and Rubella (two immunizations with the initial dose given after the first birthday or positive titers), Varicella (chickenpox—by immunization, documented history of disease or positive titers) and a current Tetanus/Diphtheria booster (within 10 years prior to the beginning of the semester). This requirement applies to all students regardless of their program of study or degree status. Students registering for the first time will be able to do so without complete records on file, but any subsequent registration will be blocked if this requirement has not been fulfilled. Immunization forms are sent out by the GW admitting office. Forms can be downloaded from gwired.gwu.edu/shs. In addition to the required immunizations, the Hepatitis B and Meningitis vaccines are recommended. The Student Health Service can give all inoculations on a fee for service basis. Further information is available at (202)741-2650.

University Counseling Center

University Counseling Center services help students resolve personal, social, career, and study problems that can interfere with their academic progress and success. Services include individual counseling, crisis intervention, group counseling, and workshops on topics such as time management, study skills, procrastination prevention, family and relationship issues, choosing a career,

stress management, conflict management, and self-esteem/self-development. The Center offers consultation and training programs for student, faculty, and staff groups. Career counseling and referral services are available to GW students. The Center provides pamphlets, books, and tapes through its self-help library. Students can apply for tutors through the Center's Peer Tutoring Service, which matches tutors with students requesting assistance for specific academic courses. Further information about all services and links to other psychoeducational materials can be obtained by visiting the Center's website at gwired.gwu.edu/counsel.

Career Center

The Career Center promotes effective career planning, teaches job search strategies, and facilitates contacts between GW students, alumni, and prospective employers through its many services. Services include full- and part-time job listings; internship listings; career consulting; workshops (including job search strategies, letters and resumes, and effective interviewing); the career resource room; on-campus recruiting; resume critiques; facilitating the federal work–study program; cooperative education; computer- and Internet-based job resources; and a credentials service that supports graduate/professional school applications. Further information on the Career Center is at gwired.gwu.edu/career.

International Services Office

The International Services Office provides services to GW's international students, scholars, faculty, and staff. The office provides advising on a variety of personal issues, including cultural adjustment, living conditions, academic concerns, and finances; provides immigration assistance and information on U.S. government requirements and regulations specific to the international community; conducts orientation programs to assist in living, studying, and working in the United States; and serves as a resource center for the University community on issues of cross-cultural understanding.

Disability Support Services

Disability Support Services provides and coordinates support services for students with a wide variety of disabilities, as well as those temporarily disabled by injury or illness. Accommodations are available through DSS to facilitate academic access for students with disabilities. Services provided without charge to the student may include orientation to campus, registration assistance, readers, interpreters, scribes, learning disabilities advising, adaptive materials and equipment, assistance with note taking, laboratory assistance, test accommodations, regular advising, and referrals. DSS does not provide content tutoring, although it is available on a fee basis from other campus resources. The University does not pay for personal attendant care. DSS is located on the 2nd floor of the Marvin Center and is open from 9 a.m. to 5 p.m. weekdays and at other times by appointment.

Multicultural Student Services Center

The Multicultural Student Services Center provides academic, co-curricular, and personal support services for all GW minority students to enhance minority student life at GW. Through the Center, minority students receive orientation to the various University resources, and are made aware of the many cultural activities and programs that exist on campus and in the greater metropolitan area. The Center provides professional and peer counseling, course advising, tutorial referrals, and campus and community mentoring programs. The staff is available to address students' academic and personal concerns.

The Multicultural Student Services Center also provides a wide range of services, educational programming, and social and cultural activities to enhance

the multicultural ideals or cultural heritage, racial understanding, academic excellence, and continuous personal development for all students. The Center oversees the Diversity Program Clearinghouse, which supports various programs designed to educate the campus in areas of cultural diversity and socioeconomic issues. The Center houses a resource center with reference books and instructional materials, and coordinates various preparatory and precollege programs.

High School/College Internship Program—The Multicultural Student Services Center oversees the High School/College Internship Program (HI/SCIP), which enrolls highly motivated District of Columbia high school seniors. Participants enroll at GW as nondegree candidates, taking a maximum of 6 credit hours per semester in addition to their high school curriculum. Application to the HI/SCIP program is made through the student's high school guidance office, and decisions are made by the Office of Admissions.

Student Activities Center

The Student Activities Center furthers the educational mission of the University by offering programs, services, and facilities that foster the social and cultural development and school spirit of members of the University community. Staff members assist individual students and campus organizations with event planning, program coordination, and participation in special projects.

Programs and activities include advisement of campus organizations, registration of student organizations, planning and coordination of major campus events, and oversight of Greek Affairs, Colonial Inauguration, the Presidential Administrative Fellows Program, band and cheerleading, and intramural and club sports. Additional information about the services offered by the Student Activities Center, and about the various student organizations and committees, can be obtained from the *Student Planner and Handbook*.

Program Board—The Program Board, composed chiefly of elected and appointed students, has the primary responsibility of allocating resources for student programming on campus. In addition, the Program Board provides funding for activities presented by various campus organizations and encourages student participation in program planning through involvement in committees on the arts, concerts, festivals, films, parties, political affairs, and public relations.

Student Government—The George Washington University Student Association is made up of all full-time and part-time undergraduate and graduate students who are registered for academic credit on campus. A body of elected and appointed individuals is responsible for representing the interests of students at the University. The Student Association provides various services for students, such as academic evaluations, test and syllabus files, and the Student Advocate Service.

Student involvement in the governance of the University is also possible through participation in various administrative and Faculty Senate committees, advisory councils of the schools and college, selected committees of the Board of Trustees, and specialized bodies, such as the Residence Hall Association, the Joint Food Services Board, and the Marvin Center Governing Board. This involvement has helped develop policies and programs beneficial to students and to the University community as a whole.

Student Organizations—Students are encouraged to become involved with existing student organizations or to initiate their own. There are approximately 350 registered organizations on campus, covering a broad spectrum of interests, including academic, professional, international, cultural, political, service, sports, hobbies, recreational, religious, and meditative groups as well as social fraternities and sororities.

The Cloyd Heck Marvin Center

The Marvin Center is the GW campus community center. The Marvin Center offers programs, services, and facilities for students, faculty, staff, alumni, and University guests. The Center's wide range of facilities includes dining locations, a theatre, lounges, recreational facilities, study rooms, travel agency, copy center, provisions grocery, GW Concierge, GW bookstore, and conference and meeting rooms in the Morris and Gwendolyn Cafritz Foundation Conference Center.

The Marvin Center provides facilities for programs conducted by the University Program Board, by academic departments that include the performing arts, and by other University organizations. The operation of the Marvin Center is overseen by Student and Academic Support Services.

The Marvin Center Governing Board is a representative body composed of students, faculty, staff, and alumni. The Board works closely with the Center's staff in the review and development of policies, guidelines, and procedures that direct the operation of the Center.

Religious Life

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the religious organizations of their own choice. Several religious bodies sponsor various groups and form a link between the University and the religious community. The advisors of the religious organizations are available for counseling to enhance religious life on campus. Religious services and special observances are also provided for the University community as announced.

Major Program Events

Art Exhibits—The work of locally, nationally, and internationally known artists is shown in exhibitions in the Luther W. Brady Art Gallery in the Media and Public Affairs Building. Student art exhibits are presented each semester in the Dimock Gallery in Lisner Auditorium.

Concert Series—The Department of Music presents a series of concerts featuring faculty, guest, and student artists throughout each year. Other concerts are held regularly in the Marvin Center, Lisner Auditorium, and the Smith Center.

Dance—The Department of Theatre and Dance presents major dance concerts, informal studio performances, experimental events, television appearances, and lecture–demonstrations. Students may audition to participate and have the opportunity to choreograph, perform, and gain experience in the technical aspects of dance productions.

Glee Club, Jazz Band, and Orchestra—The University Singers, University Band, Jazz Band, and Orchestra are available to students either as credit courses or as cocurricular activities. All of these organizations present major performances to the University community several times a year, including regular winter and spring concerts. Chamber groups and jazz combos are regularly available for participation by all students.

Program Board—The University Program Board, through its various committees and in cooperation with other campus groups, regularly sponsors films, lectures, concerts, social activities, and special events.

Theatre—The Department of Theatre and Dance produces four major plays and musicals during the year on the proscenium/thrust stage in the Dorothy Betts Marvin Theatre. Additional works, including original and experimental plays, are produced in a more intimate studio theatre. Students can participate in all aspects of theatre and may receive credit toward their B.A. or M.F.A. degrees for some of their production work.

Athletics, Recreation, and Intramurals

The Charles E. Smith Center and Lerner Family Health and Wellness Center offer many facilities for student use, including courts for basketball, volleyball, and badminton; a jogging track; a swimming pool; gymnastics and weight rooms; racquetball and squash courts; and a sauna and lockers. A broad program of intramural and recreational activities is held in the Lerner Family Health and Wellness Center designed to accommodate various levels of skill, experience, and interest. The Mount Vernon campus is home to an artificial-turf soccer/lacrosse/field hockey facility, a softball field, and 32 tennis courts.

The University is a member of the National Collegiate Athletic Association (NCAA), the Eastern College Athletic Conference (ECAC), and the Atlantic 10 Conference. Its intercollegiate varsity teams compete against major universities throughout the region and nation in such sports as basketball, baseball, soccer, tennis, golf, cross-country, crew, swimming and diving, water polo, volleyball, and gymnastics.

OTHER PROGRAMS AND SERVICES

The major sections that follow describe the undergraduate programs and courses offered by Columbian College of Arts and Sciences, the School of Business, the School of Engineering and Applied Science, and the Elliott School of International Affairs. This section briefly indicates some of the University's additional programs, services, and administrative units.

The George Washington University at Mount Vernon College

An integral part of The George Washington University, the Mount Vernon campus offers a more traditional campus atmosphere a short distance from the Foggy Bottom campus. A distinct environment within the University, GW at MVC offers fully integrated academic courses and programs as well as social and athletic opportunities to all GW undergraduates. Students may reside either at the Mount Vernon or Foggy Bottom campus; all GW students have access to courses, programs, libraries, and other services at both campuses.

Courses at the Mount Vernon campus are offered by nearly all departments of Columbian College of Arts and Sciences and by selected departments and programs of the Elliott School of International Affairs and the Schools of Business and Public Management, Engineering and Applied Science, and Public Health and Health Services. The University Honors Program maintains an office on the Mount Vernon campus and offers a residential program and a wide variety of courses. Students and faculty move freely between the two campuses on the University shuttle that runs 24/7, taking 10 to 15 minutes.

GW at MVC offers a set of residential experiences, including the Elizabeth Somers Women's Leadership and Dean's Scholars in Globalization Programs. The Women's Leadership Programs include Women in International Development, Women in U.S. and International Politics, Women in International Arts and Culture, and Women in Science and Medicine. Each provides a one-year living and learning experience for first-year women with a set of courses linked around the theme of women's leadership, historical as well as contemporary. The program courses fulfill certain general requirements in all the undergraduate schools. The teaching assistants for the academic courses also live together with the students in the residence hall, developing co-curricular activities that emphasize the supportive community, tying together the various strands of the

program. The intent of this program is to create an integrated community, which encourages energized classroom discussions that continue in the dining hall and the residence hall.

The Mount Vernon Campus Life Office coordinates student support services for GW at MVC, including the development of programs and services that create a distinctive environment for students on the Mount Vernon campus, cooperative programming with the Foggy Bottom campus, and the cultivation of leadership and community service opportunities for students.

University Honors Program

The University Honors Program is an enhanced educational program open to students enrolled in any of the undergraduate schools at The George Washington University. The Honors Program offers a special series of courses that are designed to engage and challenge talented students. Members of the Honors Program take one or more of these courses each semester as part of their undergraduate program of study. The courses range from small seminars that fulfill general curriculum requirements to special topics and cross-disciplinary courses.

In addition, the University Honors Program offers its students various special academic activities to complement the curriculum, such as the twice-yearly University Symposium, a weekend-long event that includes public lectures, discussions, and student presentations on a notable topic or theme. The Honors Program administers two residential communities for its students as well as a center for national fellowship competitions to assist any GW student pursuing prestigious fellowship opportunities.

Students must apply for admission to the University Honors Program. Entering freshmen who are in the top 10% of their high school class or have achieved SAT scores above the 85th percentile may apply to the University Honors Program when they apply for admission to the University. In addition to high academic achievement, the Program seeks students who are accomplished beyond the classroom, whether in the creative arts, in community service or leadership ability, or in other distinctive endeavors. Current GW students who have achieved a cumulative GPA of 3.4 or higher and have at least four semesters left before graduating may apply to the program at the end of September for admission in the spring semester and at the end of January for admission in the fall semester. The Honors Program has special advisors to help students plan their program of study. Scholastic requirements for remaining in the Honors Program are listed under the major head of Honors in the course listings section.

A complete description of the University Honors Program is given in the Honors Program Handbook, available at the Honors Office or through its website: www.gwu.edu/~uhpwww. The website also gives a list of current classes and activities of the Honors Program.

Enosinian Scholars—Named for the first undergraduate academic society established at The George Washington University in 1822, the Enosinian Scholars Program is a special senior-year thesis program that requires two semesters of research, a written thesis, and an oral examination with outside reviewers. Students in the Enosinian Scholars Program may also pursue Special Honors in their department or program. Application to the Enosinian Scholars Program is made through the University Honors Program, which administers the Enosinian Scholars Program; membership in the Honors Program is not required.

Welling Professors

The George Washington University has a category of distinguished "occasional" professorships known as the Welling Professors. The professorships are named for James Clark Welling, who was president of GW for most of the last quarter of the 19th century, during which time this institution assumed many of the attributes of a modern research university. The intent of the Welling Professorships, established in 1995, is to bring internationally distinguished scholars to GW on

an occasional basis and engage them in the intellectual life of students and faculty through public lectures, small group discussions, and other forums.

Residential Educational Programs

Among the many living and learning communities available at GW are enhanced educational programs in which first-year students reside together and take a common course or series of courses. Programs include Politics and Values, JWF International Affairs, Dean's Scholars in Globalization, and the Elizabeth Somers Women's Leadership Programs. Further information is available from the GW Community Living and Learning Center.

Joint and Dual Degree Programs

A large number of five-year programs allow students to earn a bachelor's degree and a master's degree, with a modest amount of cross-crediting of course work. Programs available within Columbian College of Arts and Sciences are listed under the department concerned; programs within the School of Business, the School of Engineering and Applied Science, and the Elliott School of International Affairs are listed under the School's entry.

Joint degree programs are available for study toward the Doctor of Medicine degree: the integrated B.A./M.D. program described under Columbian College of Arts and Sciences, and the integrated engineering and medicine program, under the School of Engineering and Applied Science.

Secondary Fields of Study

A program of secondary fields of study provides undergraduates opportunities for formal interschool study. Students must be enrolled in a degree program and in good academic standing to be eligible to take a secondary field in another school. The secondary fields generally consist of 12 to 18 hours of prescribed courses, with scholarship requirements determined by the school offering the field. Upon satisfactory completion of all requirements, the secondary field and the courses taken in support of the field are entered on the student's transcript. Information is available in the student services offices of the schools concerned.

Summer Sessions

Courses are offered during the summer by all degree-granting divisions of the University. Summer Sessions also offers special programs that are not available during the regular academic year. Courses are offered during both day and evening hours. Students who are enrolled at the University for the spring semester may register for the following Summer Sessions without special application. Those who wish degree status may seek admission from the appropriate school within the University. Those who do not wish to work toward a degree at the University may apply through the process described in the Summer Sessions Announcement. For a complete statement concerning summer term work, see the Summer Sessions Announcement at www.gwu.edu/summer or by contacting 202-994-6360 or gwsummer@gwu.edu.

Study Abroad

Undergraduates who wish to study abroad during the academic year should contact the Office for Study Abroad concerning eligibility, appropriate procedures, and requirements for participation. Participants are billed GW charges for study abroad, rather than fees indicated by the visited school. To be eligible for the transfer of academic credit from study abroad, GW students must select a program from the University's approved list of study abroad programs. Students must have a 2.5 cumulative grade-point average at the time of application and must have completed 45 credit hours prior to departure. Transfer

students must complete one full semester at GW prior to application. Students who have a significant disciplinary history or who are on academic or disciplinary probation at the time of application are not eligible to study abroad. All programs of study abroad must be approved on the required forms prior to departure. Course credits earned in authorized programs with a *C* or above are transferable toward the appropriate degree at The George Washington University, provided there is no duplication of work done previously and faculty have designated each course with a GW course equivalent. Participants agree to abide by all procedures and regulations for study abroad as indicated in the Study Abroad Handbook, Memorandum of Agreement, and Participation Agreement distributed through the Office for Study Abroad. In addition to academic year programs, study abroad is available at varying locations during the summer; see Summer Sessions, above.

Office of University Students

The Office of University Students makes main-campus, credit-bearing courses available to those who are not currently degree candidates at this University. Such students, often employed in government or industry, may be taking courses to enhance their career potential or as a matter of personal interest. They may be candidates for higher degrees at other institutions, sent here for special work as part of a graduate program. They may be undergraduates matriculated elsewhere, taking courses for transfer to their own institution or preparing for graduate work.

The Office of University Students requires a minimum registration of 3 credit hours per semester or session, except in special circumstances as approved by the director. Medical and law courses are not available to nondegree students.

Entrance Requirements—The Office of University Students requires visiting, nondegree applicants to have appropriate academic preparation prior to enrollment. Prerequisites are specified in the departmental course descriptions in this Bulletin. Contact the specific department for further information regarding appropriate academic background for a particular course. In addition, the applicant who has previously attended this or another college or university must be in good standing at that institution. An applicant who has been suspended from any educational institution for poor scholarship will not be considered for admission for one calendar year after the effective date of the suspension. An applicant who has been denied undergraduate admission within this University will not be considered for admission as a nondegree student for the same semester for which the application was denied. Applications for admission through the Office of University Students are available online at the OUS website. For information on application and registration, please refer to the *Schedule of Classes* or visit www.gwu.edu/~ous.

Tuition and Fees—For information regarding fall and spring semester tuition and fees, see Fees and Financial Regulations in this Bulletin. For information regarding summer tuition and fees, see the Summer Sessions Announcement at www.summer.gwu.edu or by request, by contacting 202-994-6360 or gwsummer@gwu.edu.

Regulations—Prospective and registered students are urged to acquaint themselves with the regulations concerning attendance and withdrawal under University Regulations in this Bulletin or at www.gwu.edu/~ous.

The deadline for adding a course during the regular fall and spring semester is the end of the second week of classes. A course dropped during the first four weeks of classes will not appear on a student's transcript. A course dropped after the fourth week but before the end of the eighth week will be assigned the grade of *W* (Authorized Withdrawal). The deadline for dropping a course without academic penalty is the end of the eighth week of classes. The deadline for complete withdrawal from a student's entire program of courses without academic penalty is the end of the ninth week of classes.

If the symbol *I* (Incomplete) is assigned, the instructor normally sets a period (maximum of one year) within which the uncompleted work must be made up. An Incomplete that is not changed within one calendar year becomes a grade of *IF* on the student's record.

All adjustments to course schedules during a regular summer session must be made within the first seven days of the official start of classes.

Consortium of Universities of the Washington Metropolitan Area

The George Washington University is a member of the Consortium of Universities of the Washington Metropolitan Area. Twelve universities in the Washington area—American University, Catholic University of America, Gallaudet University, George Mason University, George Washington University, Georgetown University, Howard University, Marymount University, Southeastern University, Trinity University, the University of the District of Columbia, and the University of Maryland—are associated in a Consortium through which they coordinate the use of their respective facilities. Students in approved programs leading to degrees in any one of these institutions have the opportunity to select from the combined offerings the particular courses that best meet their needs. This privilege is subject to regulations of the school in which the student is enrolled. Participation is limited to degree candidates. Law and medical students are excluded from participation, except for LL.M. candidates. See the *Schedule of Classes* for specific regulations and information concerning registration for Consortium courses.

Registration forms and instructions are available from the registrar of the institution in which the student is enrolled. Students register and pay tuition at their own institutions for all Consortium courses; course fees are payable to the visited institutions.

George Washington University students may enroll through the Consortium in the Army ROTC program offered at Georgetown University, the AFROTC program at the University of Maryland, or the Army ROTC or AFROTC at Howard University. Scholarships are available. Those interested should contact the ROTC enrollment officer at one of these universities. Limited credit for such courses (primarily advanced ROTC) may be assigned for electives to meet degree requirements at George Washington University; prior approval is required by the dean of the school in which the student is enrolled.

The University Libraries

The George Washington University is a member of the Association of Research Libraries. The library collections of the University are housed in the Melvin Gelman Library (the general library of the University), Jacob Burns Law Library, Paul Himmelfarb Health Sciences Library, Virginia Campus Library, and Eckles Memorial Library on the Mount Vernon campus.

These collections contain over 2 million volumes. University appropriations supplemented by endowments and gifts provide research materials in the social sciences, the humanities, the sciences, and business. Gifts from many sources have enriched the collections, including a large National Endowment for the Humanities grant to strengthen the University's humanities holdings. The libraries hold over 18,000 serials.

Information concerning the use of the libraries may be obtained from the GW Information System, Gelman home page, and at library service desks. Individual and class instruction in the use of the library and orientation to library facilities are given by librarians upon request as well as through print, media, and computer-assisted instruction. The libraries strive to fulfill the curricular and research needs and interests of the students. Through computerized searches of bibliographic databases, students identify and locate desired research materials not easily found through more traditional methods. The staff

assists all members of the University in using the rich resources of the Washington area and the unusual opportunities they offer for extensive research.

Students, faculty, and staff at George Washington University (except law and medical students) may borrow directly from the main campus libraries of six other academic institutions in the Washington Research Library Consortium (WRLC). Students may also obtain books and journal articles on interlibrary loan from other libraries in the area and throughout the United States.

ALADIN is the electronic library resource of WRLC and contains the combined on-line catalog of the seven member universities with more than 3 million records representing almost 5 million volumes, as well as a rich array of electronic databases, indexes, and full texts. ALADIN can be accessed from numerous computers in the libraries as well as remotely from on and off campus.

Information Systems and Services (ISS)

ISS provides technology services to students, faculty, and staff, including e-mail accounts, web hosting space, training, and technical support for commonly used software and University systems.

Center for Academic Technologies

The Center for Academic Technologies supports all aspects of instruction, including assisting faculty in the development of new teaching approaches and materials and the operation of the University's many technology-enhanced classrooms and computer laboratories, which are available to all students for class projects and individual research.

The Writing Center

The Writing Center provides writing assistance to GW students for all courses, both undergraduate and graduate, in all schools of the University and at all levels of experience and expertise. Students receive assistance in identifying writing problems and learning how best to express ideas. Trained tutors (undergraduate peer tutors, graduate students, and the director and other members of the faculty) work with students individually on areas of specific need or interest. Tutors provide assistance in such areas as organizing a mass of information efficiently and clearly, using correct grammar and punctuation, getting started on a writing project, developing a thesis, providing evidence in support of an argument, and presenting the findings of an experiment or the solution to a research problem.

The Speech and Hearing Center

The Speech and Hearing Center provides diagnosis and treatment of a wide range of speech, language, and hearing disorders. These include developmental impairments of articulation and language, stuttering, voice disorders, and speech and language impairments resulting from neurological damage. Services are available for persons wishing to modify a regional dialect or foreign accent. Evaluation and aural rehabilitation are also provided for hearing-impaired individuals. The Speech and Hearing Center operates in conjunction with the Department of Speech and Hearing Science.

Honor Societies

Honor societies that maintain active chapters at George Washington University include Phi Beta Kappa and Sigma Xi as well as those specific to given academic fields, such as Alpha Epsilon Delta, Beta Alpha Psi, Beta Gamma Sigma, Delta Phi Alpha, Eta Kappa Nu, Omicron Delta Epsilon, Omega Rho, Pi Alpha Alpha, Pi Sigma Alpha, Pi Tau Sigma, Psi Chi, Sigma Delta Pi, Sigma Iota Rho, and Tau Beta Pi. The freshman honor society Phi Eta Sigma is open to qualified students in all undergraduate programs.

Prizes

The following academic prizes are supported by permanently endowed funds established through the Office of the Vice President and Treasurer. The many other prizes and awards available to GW students are funded annually, rather than by permanent endowment, and are listed in the annual commencement program when information is provided in time for publication.

Abdelfattah Abdalla Prize—Awarded annually to a junior or senior in the Department of Electrical and Computer Engineering for scholarship and service.

Norman B. Ames Memorial Prize—Awarded annually to a graduating senior in the School of Engineering and Applied Science who has made significant contributions to the School and the University.

Buka Family Prize—Provided by Ruth Buka in honor of her parents, Georg and Rosa Buka, and her sister, Hilde Buka-Lacour. It is awarded to the most outstanding student in German languages and literatures.

Byrne Thurtell Burns Memorial Prize—Awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind and character as to give promise of future achievement.

Wilbur J. Carr Prize—Established in 1962 by Edith K. Carr, former Trustee of the University, in memory of her distinguished husband, who was graduated from the School of Comparative Jurisprudence and Diplomacy in 1899. It is awarded annually to that student in the graduating class of the University who has demonstrated outstanding ability in the study of international affairs and who has given evidence of possessing in marked degree the qualities that produce the good citizen and the dedicated public servant.

Astere E. Claeyssens Prize—Established in 1981 by the Trustees of the Bess and Arthur Dick Family Foundation. It is awarded for the best original work in playwriting by a student enrolled in the University.

John Henry Cowles Prizes—Two prizes, established by John H. Cowles, Grand Commander of the Supreme Council of Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America. Awarded upon graduation to the graduate or undergraduate student with the best overall scholastic achievement and leadership potential in the School of Business and in the Elliott School of International Affairs.

DeWitt Clinton Croissant Prize—Awarded annually to the undergraduate student enrolled in a course in drama or active in University dramatics who submits to the English Department the best essay on drama or the theater.

E.K. Cutter Prize—Established by Marion Kendall Cutter "for excellence in the study of English." Awarded to the member of the graduating class whose record in English, combined with general excellence, shows the most marked aptitude for and attainment in English studies.

Isaac Davis Prizes—Established in 1847 and awarded annually to the three seniors who have made the greatest progress in public speaking while enrolled in the University. Awards are determined by a public-speaking contest in which the participants deliver original orations. Only members of the senior class of Columbian College who are candidates for the degree of Bachelor of Arts or Bachelor of Science are eligible to compete.

Elton Prize—Established by the Reverend Romeo Elton, of Exeter, England, and awarded annually to the student with the highest average in the most advanced course in the Greek language and literature.

Jesse Frederick Essary Prize in Journalism—Established by Helen Essary Murphy and awarded annually to a student who has given promise of sound citizenship and who submits the best printed and published evidence of ability in "forthright reporting" and good journalistic writing in a student publication or elsewhere.

Jessie Fant Evans Prize—A bequest of Joshua Evans, Jr., in 1971, in recognition of his wife's distinguished record at and service to the University, on whose Board of Trustees she served as the first woman member. Awarded annually to an outstanding senior student in a contemporary history course.

Joshua Evans III Prize in Political and Social Science—A memorial prize "established by friends because of an outstanding life." Awarded annually to that student in the graduating class "who has demonstrated his/her signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his/her fellows."

Willie E. Fitch Prize—Established by James E. Fitch in memory of his son. Awarded annually to a senior student for the best examination in chemistry.

Alfred Martin Freudenthal Prize—Awarded annually to the senior in the School of Engineering and Applied Science who graduates with the highest scholastic standing.

Goddard Prizes—A memorial established by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard. Three prizes are awarded annually to junior or senior students earning the highest average in American literature; French language and literature; and business administration or accounting.

Harmon Choral Prize—Established in 1986 in memory of Dr. Robert H. Harmon, director of the Glee Club from 1924 to 1964, by his brother Bishop Nolan Harmon and the GW Department of Music. Awarded annually to one or two students who have made outstanding contributions to the choral programs.

Ching-Yao Hsieh Prize—Two prizes awarded annually, one to an undergraduate and one to a graduate student in the Department of Economics.

Gardiner G. Hubbard Memorial Prize in United States History—Established by Gertrude M. Hubbard in memory of her husband and awarded annually to that member of the graduating class majoring in history who has maintained the highest standing in courses in United States history.

Cecille R. Hunt Prize—Offered annually to deserving art students.

Korean Language and Culture Prize—Awarded annually to a student enrolled in a Korean language/culture course.

Minna Mirin Kullback Memorial Prize—Established in 1968 by Solomon Kullback in memory of his wife. Awarded annually by a committee of faculty members of the Department of Statistics to a full-time undergraduate or graduate student majoring in statistics, who will have completed 18 credit hours of statistics courses by the end of the spring semester.

John Francis Latimer Prize in Classics—Established in 1973. Awarded to a graduating senior who has made the most outstanding record as a major in the Department of Classics.

Martin Mahler Prize in Materials Testing—Awarded to the upper-division or graduate student in engineering who submits the best reports on tests in the materials laboratory course, with preference given to prestressed concrete tests.

Hilda Haves Manchester Prize in Sociology—Established in honor of Hilda Haves Manchester, B.A. 1932, an outstanding student whose major field was sociology. Awarded annually by Columbian College to the senior student majoring in sociology who has the highest scholastic record.

The Barry Manilow Endowed Prize in Music—Established in 1983. Awarded annually to a student majoring in music. The award is made on the basis of academic performance and musical ability, as determined by a committee of faculty appointed by the chair of the Music Department.

Vivian Nellis Memorial Prize—Awarded to a student in the English Department who has shown special promise in the field of creative writing.

Ruggles Prize—Established by Professor William Ruggles in 1859. Awarded annually to a candidate for a bachelor's degree for excellence in mathematics.

Howard C. Sacks Prize—Awarded to a student in political science who has demonstrated outstanding academic achievement in the study of Far Eastern affairs.

Hermann and Johanna Richter Schoenfeld Prize—Established in grateful appreciation of the inspired teaching and devotion to his students of Dr. Hermann Schoenfeld, who for more than 20 years until his death in 1926 headed the Department of German. Hermann Schoenfeld, Ph.D., LL.D., was widely recognized as a scholar of distinction whose presence on the faculty added prestige to the University. This prize is given annually to a member of the graduating class for excellence in historical and cultural phases of German studies.

Julian H. Singman Prizes—Two prizes awarded annually, one in design and one in aquarelle painting.

Sylvia S. Speck Prize—Awarded to a graduating senior for exemplary academic achievement in English literature.

Staughton Prize—Established by the Reverend Romeo Elton and awarded annually to the student making the best record in the most advanced courses in Latin language and literature.

Alfred E. Steck Memorial Prize—Awarded for proven excellence in the field of sculpture.

James MacBride Sterrett, Jr., Prize—Established in 1911 by Professor Sterrett in memory of his son. Awarded annually to the student who obtains the highest average in Physics 1 and 2.

Charles Clinton Swisher Historical Club Prize—Established in 1936 by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Swisher. Awarded annually to the student who submits the best essay covering some phase of medieval history.

Thomas F. Walsh Prize—Established in 1901 and awarded annually to the student who submits the best essay in Irish history.

Alexander Wilbourne Weddell Prize—Established in 1923 by Virginia Chase Weddell in memory of her husband. Awarded annually to a degree candidate who writes the best essay on "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

GW Alumni Association

The objectives of this organization are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Membership in the Association is conveyed automatically to anyone who has been graduated from any school or division of the University. Anyone who has earned 15 credit hours or the equivalent at the University, who has left the University in good standing, and whose class has graduated is eligible for membership; in the case of the Office of University Students, however, only the "15 credit hours earned" requirement and not the "graduation of the class" requirement applies. Graduates of Center for Professional Development certificate programs are also eligible.

A Governing Board, composed of members representing the constituent alumni organizations, directs the activities of the Association. The voluntary leadership of the Association works closely with the staff of the Office of Alumni Relations in carrying out Association affairs. The Association may be contacted through the Office of Alumni Relations.

UNIVERSITY REGULATIONS

Students enrolled in the University are required to conform to the following regulations and to comply with the requirements and regulations of the school in which they are registered. Students who withdraw or are suspended, or who, for any other reason, are not registered at the University for one semester or more, may reapply and, if readmitted, continue their program only under the regulations and requirements in force at the time of return.

If a student knowingly makes a false statement or conceals material information on an application for admission or any other University document, the student's registration may be canceled. If such falsification is discovered after the student has matriculated at the University, the student may be subject to dismissal from the University. Such a student will be ineligible (except by special action of the faculty) for subsequent registration in the University.

Registration

Information on registration procedures is stated on the Registrar's Office website and in the *Schedule of Classes*, which is available in advance of each semester.

Registration in courses is open only to those persons formally admitted to the University by the appropriate admitting office and to continuing students in good standing.

Students may not register concurrently in this University and another institution without the prior permission of the dean of the school in which they are registered in this University. With the exception of students enrolled in a joint degree program, registration in more than one school of the University requires the written permission of the deans concerned, prior to registration. Registration is not complete until all financial obligations have been met. Individuals without a valid registration may not attend class or earn any course credit.

Eligibility for Registration—Registration for the following categories of on-campus students is held on the days of registration published in the *Schedule of Classes*. A student who is suspended or whose record is encumbered for any reason is not eligible to register. Registration in a given course may be denied to nondegree students by the Office of University Students when space is needed for degree candidates.

New Student—Upon receipt of a letter of admission, the new student is eligible for registration on the stated days of registration. Registration for new students is typically conducted on stated days as part of the Colonial Inauguration orientation program.

Readmitted Student—A student previously registered in the University who was not registered during the preceding semester must apply for and be granted readmission by the appropriate admitting office before being eligible for registration.

Continuing Student—A student registered on campus in the immediately preceding semester or the summer session preceding the fall semester is eligible to register assuming good standing and enrollment in a continuing program.

Completion of Registration—Registration is not complete until financial obligations have been fulfilled. Students who do not complete their financial obligations in a timely manner may have their registration canceled and will not be permitted to attend class.

Registration for Consortium Courses—Degree students interested in taking courses at any of the other institutions in the Consortium of Universities of the Washington Metropolitan Area, Inc., should consult the program announcements of the other institutions. Consortium registration forms and instructions may be picked up in the Office of the Registrar. In order to participate in the Consortium program, students must obtain the approval of an advisor and should ascertain from the department of the institution where the course is

taught whether they are eligible for the course and whether there is space in the class. Specific inquiries should be addressed to the Registrar's Office. Detailed information concerning Consortium policy and procedures is printed in the *Schedule of Classes* and is available on the Registrar's Office website.

Adding and Dropping Courses

During the registration period (before the end of the second week of classes) students may add or drop courses using GWeb. After the second week of classes, students who wish to add or drop a course must complete a Registration Transaction Form and submit the form to the office of their dean; forms are available on line, at deans' offices, and in the Office of the Registrar. Adding a course after the second week requires a signature of the instructor or other authorized member of the department.

A course dropped during the first four weeks of classes will not appear on the student's transcript. A course dropped after the fourth week but before the end of the eighth week will be assigned a notation of *W* (Authorized Withdrawal).

The deadline for dropping a course without academic penalty is the end of the eighth week of classes in the fall and spring semesters. After the end of the eighth week of classes, dropping a course without academic penalty is only possible after the student presents a petition to the dean and receives written permission.

All charges for courses from which the student withdraws are subject to the refund policy listed under Fees and Financial Regulations in this Bulletin. Failure to withdraw by these procedures can result in an extended financial obligation and the recording of a grade of *F* (Failure) or a notation of *Z* (Unauthorized Withdrawal).

Changes in Program of Study

Changes Within a School—A student may not substitute one course for another within an established program of study or change status from credit to audit or from audit to credit without the approval of the dean of the school in which he or she is registered. Change from one major field to another within the same school may be made with the approval of the dean.

Transfer Within the University—Application for transfer to another school must be made to the appropriate admitting office on the form provided by the office concerned. Students transferring within the University are advised to study carefully the requirements listed below under Graduation Requirements and to note that unless otherwise specified, in all undergraduate divisions, 30 credit hours, including at least 12 credit hours in the major field, must be completed while registered in the school from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements that must be fulfilled. A maximum of 45 credit hours earned through the Office of University Students may be applied toward a bachelor's degree in the degree-granting schools of the University.

Grades

Grades are made available to students through the Office of the Registrar after the close of each semester. The following grading system is used: *A*, Excellent; *B*, Good; *C*, Satisfactory; *D*, Low Pass; *F*, Fail; other grades that may be assigned are *A*−, *B*+, *B*−, *C*+, *C*−, *D*+, and *D*−. Symbols that may appear include *AU*, Audit; *I*, Incomplete; *IPG*, In Progress; *W*, Authorized Withdrawal; *Z*, Unauthorized Withdrawal; *P*, Pass; *NP*, No Pass; *R*, Need to Repeat Course.

Except for courses that specifically state that repetition for credit is permitted, a candidate for a degree at this University may not repeat a course in which a grade of *D*− or better was received, unless required to do so by the department

concerned. A written statement, indicating that the student is required to repeat the course, must be submitted to the student's dean by the appropriate department chair.

The symbol of *Z* is assigned when students are registered for a course that they have not attended or have attended only briefly, and in which they have done no graded work. At the end of the academic year, students' records are reviewed; if there is more than one *Z* per semester, a student's record will be encumbered until released by the student's advisor or academic dean. The symbol of *Z* is not a grade but an administrative notation.

Incompletes—The symbol *I* (Incomplete) indicates that a satisfactory explanation has been given the instructor for the student's inability to complete the required course work during the semester of enrollment. At the option of the instructor, the symbol *I* may be recorded if a student, for reasons beyond the student's control, is unable to complete the work of the course, and if the instructor is informed of, and approves, such reasons before the date when grades must be reported. This symbol may be used only if the student's prior performance and class attendance in the course have been satisfactory. Any failure to complete the work of a course that is not satisfactorily explained to the instructor before the date when grades must be turned in will be graded *F*, Failure. If acceptable reasons are later presented to the instructor, that instructor may initiate an appropriate grade change, which in all cases will include the symbol *I*. The course work must be completed within the designated time period agreed upon by the instructor and student, but (except in the School of Business) no more than one calendar year from the end of the semester in which the course was taken. In the School of Business, the symbol *I* must be changed by a date agreed on by the instructor and the student, but no later than the last day of the examination period for the fall or spring semester immediately following the semester or summer session in which the symbol *I* is assigned. When work for the course is completed, the instructor will complete a grade change form and turn it in to the Office of the Registrar. The grade earned will be indicated in the form of *I*, followed by the grade. The indication of *I* cannot be removed and remains on the student's permanent academic record even after the course has been successfully completed. If work for the course is not completed within the designated time, the grade will be automatically converted to a grade of *IF*, Incomplete/Failure, 0 quality points, and the grade-point average and academic standing recalculated.

The Grade-Point Average—Scholarship is computed in terms of the grade-point average, obtained by dividing the number of quality points by the number of credit hours for which the student has registered, both based on his or her record in this University. The grade-point average is computed as follows: *A*, 4.0; *A*−, 3.7; *B*+, 3.3; *B*, 3.0; *B*−, 2.7; *C*+, 2.3; *C*, 2.0; *C*−, 1.7; *D*+, 1.3; *D*, 1.0; *D*−, .7; *F*, 0, for each credit hour for which the student has registered in a degree program. Although credit value for a course in which a grade of *F* is earned appears on the transcript for the purpose of calculating the grade-point average, no academic credit is awarded. In the case of a student who is allowed to repeat a course, the first grade received remains on the student's record and is included in the grade-point average. Courses marked *AU, CR, I, IPG, P, NP, R, W,* or *Z* are not considered in determining the average, except that courses marked *I* will be considered when a final grade is recorded. With the exception of Consortium courses, grades in courses taken at other institutions are not considered in computing the grade-point average.

Latin Honors

Bachelor's degrees with honors are awarded to students whose academic records give evidence of particular merit. The student's grade-point average determines the level of honors as follows: *cum laude*, 3.4–3.59; *magna cum laude*,

3.6–3.79; *summa cum laude*, 3.8–4.0. The grade-point average includes all course work completed at GW. To be eligible for an honors designation, a student must complete at least 60 hours of course work with letter grades (grades included in calculating the grade-point average) at GW.

The grade-point average is calculated by the Office of the Registrar, and the honors designation is entered on the transcript and diploma of those students who earn an honors designation. If Latin honors are entered in the commencement program, honors status will be determined on the basis of work completed by the end of the seventh term and entered only for those students who have completed seven-eighths of the credit hours required for the degree. Latin honors indicated on the diploma are calculated on the basis of all course work completed. The diploma and transcript are the official indication that a degree was conferred and Latin honors awarded.

Special Honors

Special Honors may be awarded by the faculty to any member of the graduating class for outstanding achievement in the student's major field on recommendation of the major department. The student must fulfill all of the following requirements: (1) Candidacy for Special Honors must be approved by the faculty member representing the major department or field not later than the beginning of the senior year. (2) Such other conditions as may be set at the time the candidacy is approved must be met. (3) At least one-half of the courses required for the degree must have been completed at GW. (4) The specific requirement of the school in which the student is registered must be fulfilled as follows: (a) Columbian College of Arts and Sciences—grades of *A* through *B–* in 50 percent of the courses taken at GW; (b) the School of Engineering and Applied Science or the School of Business—a grade-point average of at least 3.0 on all course work taken at GW; (c) the Elliott School of International Affairs—a grade-point average of at least 3.4 on all course work taken at GW. Special honors awards appear on the transcript.

Graduation Requirements

Degrees are conferred in January, May, and August. To be eligible for graduation a student must have met the admission requirements of the school in which registered; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree as stated in this bulletin; filed an application for graduation by the published deadline date; and be free from all indebtedness to the University. Enrollment is required for the semester or summer at the close of which the degree is to be conferred, and all degree requirements must be completed by the last day of final examinations for that semester or summer session. Students who pursue a double major across two schools must complete the primary major in their own school in order to graduate. A second major may supplement the primary major but may not substitute for it.

Participation in the Commencement Ceremony—Participation in the annual commencement ceremony held in May is open to students who have applied to graduate in the current spring semester or who graduated the preceding fall semester or summer session. Students, graduate or undergraduate, who need no more than 9 credit hours to complete their degree requirements, may participate in May commencement ceremonies if there is a reasonable expectation that they will be able to obtain the needed credits during the following summer. The maximum of 9 credit hours is firm and not subject to petition. Summer graduates who elect to attend the preceding May ceremony must apply for graduation no later than February 1. Students who apply after the published deadlines are not guaranteed commencement materials and may not be listed in the commencement program.

Continuous Enrollment Status

Once entered in a degree program, a student is expected to be continuously enrolled and actively engaged in fulfilling the requirements for the degree each semester of the academic year until such time as the degree is conferred. A student is considered to be continuously enrolled when registered for courses or when engaged in and appropriately registered for activities such as the following, with the prior approval of the school in which the student is enrolled: cooperative work semester; study abroad program; attendance at another institution with prior approval to have work transferred back to the GW program; completion of outstanding work in courses in which a grade of Incomplete or In Progress was received (at the undergraduate level); or non-course instructional activities unique to the particular school. This status is generally limited to one year. Should the student break continuous enrollment at the University and not request and be granted a leave of absence (see below), he or she must apply for readmission and, if granted, be subject to the requirements and regulations then in force.

Leave of Absence

Should a degree student find it necessary to interrupt active pursuit of the degree, he or she may petition the dean for a leave of absence for a specific period of time, generally limited to one calendar year. A degree student who discontinues active enrollment in degree studies without being granted a leave of absence, or a student granted a leave who does not return to active study at the close of the period of approved absence, must apply for readmission and be subject to the regulations and requirements then in force. The right to use of University facilities is suspended while the leave is in effect.

Policy Regarding Students Called to Active Military Duty

Any student who is a member of a military reserve unit or the National Guard and is activated or called to active duty early in a semester or summer session automatically will be entitled to a full refund of all tuition and fees that he or she has paid toward the expenses of that academic term. If the notification of the call to active duty comes after the mid-term examinations or after other substantial graded work has been completed, the student will have the option of either taking a full refund of tuition and fees or taking an Incomplete in his or her courses with the privilege of returning to complete all required course work at some future date without payment of any further tuition and fee charges. It is the responsibility of the student to present evidence of his or her activation to the Office of Student Accounts and to request the appropriate refund.

Should a degree student called up for active duty find it necessary to interrupt active pursuit of the degree, he or she may petition the dean for a leave of absence for a specified period of time, generally limited to one calendar year. Deans are encouraged to grant any request to extend the leave of absence for longer than the customary period should military service require an absence of more than one year.

All students on active duty will be automatically exempted from the request for a $50 voluntary library contribution without requiring any communication from them or their initials on the bill.

Complete Withdrawal From the University

A degree-seeking student who wishes to withdraw from all courses during a given semester must complete a Complete Withdrawal Form and submit it to the Office of the Registrar. Forms are available on line, at deans' offices, and in the Office of the Registrar. The deadline for complete withdrawal from all courses without aca-

demic penalty is the end of the ninth week of classes. Complete withdrawal after the ninth week requires a petition to the dean.

All charges for courses from which the student withdraws are subject to the refund policy listed under Fees and Financial Regulations in this Bulletin. Failure to complete a Complete Withdrawal Form can result in an extended financial obligation and the recording of grades of *F* (Failure) or notations of *Z* (Unauthorized Withdrawal).

University Policies and Definitions

University Policy on Equal Opportunity—The George Washington University does not unlawfully discriminate against any person on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation. This policy covers all programs, services, policies, and procedures of the University, including admission to educational programs and employment. The University is also subject to the District of Columbia Human Rights Law.

Inquiries concerning the application of this policy and federal laws and regulations regarding discrimination in education or employment programs and activities may be addressed to Susan B. Kaplan, Associate Vice President for Human Resources, The George Washington University, Washington, D.C. 20052, (202)994-4433, or to the Assistant Secretary for Civil Rights of the U.S. Department of Education.

Academic Integrity—The University community, in order to fulfill its purposes, must establish and maintain guidelines of academic behavior. All members of the community are expected to exhibit honesty and competence in their academic work. Incoming students have a special responsibility to acquaint themselves with, and make use of, all proper procedures for doing research, writing papers, and taking examinations. Members of the community will be presumed to be familiar with the proper academic procedures and held responsible for applying them. Deliberate failure to act in accordance with such procedures will be considered academic dishonesty. Acts of academic dishonesty are a legal, moral, and intellectual offense against the community and will be prosecuted through the proper University channels. Copies of the University Code of Academic Integrity can be obtained from the following officers: all department chairs, all academic deans, the Registrar, and the Vice President for Academic Affairs.

Patent and Copyright Policies—Students who produce creative works or make scientific discoveries while employed or supported by the University or through substantial use of University resources are subject to the University's patent and copyright policies (see http://www.gwu.edu/~research/policies.htm under Intellectual Property).

Human Research Requirements—Students who are planning to conduct research involving the use of human subjects (for a thesis, dissertation, journal article, poster session, etc.) must obtain Institutional Review Board (IRB) approval before collecting any data. In order to receive this approval, contact the Office of Human Research (Ross Hall, Suite 712, 202-994-2715, or see www.gwumc.edu/research/human.htm) to submit the study for the approval process.

The Library—All students registered in the University have the privilege of using the University's Gelman Library. Its stacks are open, and all students are welcome to browse. Authorized GW identification is needed to enter the library and to borrow books. Any book that circulates is subject to recall by the library if needed for reserve or requested by another user after a minimum of 20 days. Reserve books must be used in the library, except that they may be withdrawn for overnight use two hours before closing time. Transcripts of grades are withheld until a student's library record is clear, with all borrowed books returned and any fines paid. All students using the University's Gelman Library are

expected to be familiar with its detailed regulations, available at any of the library's service desks.

Use of Correct English—A report regarding any student whose written or spoken English in any course is unsatisfactory may be sent by the instructor to the dean of the school, who may assign supplementary work, without academic credit, varying with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the dean.

Name of Record—A student's name of record includes the first name, middle initial or full middle name, and the family name. Nicknames may not be used. The University will change the name of a currently enrolled student on its official records but will require satisfactory evidence of a legal basis for the change. The diploma is awarded under the official name of record at the time of graduation.

Student Status—For the purpose of defining student status, undergraduates taking 12 or more credit hours per semester (6 credits in the summer) are considered to be full time, those taking 6 to 11 credits per semester are considered to be half time, and all others are considered to be part time.

Generally, a student becomes a sophomore upon completion of 30 credit hours, a junior upon completion of 60 credit hours, and a senior upon completion of 90 credit hours.

Attendance—Students may attend only those classes for which they are officially registered. Regular attendance is expected. Students may be dropped from any course for undue absence. A student suspended for any cause may not attend classes during the period of suspension. Students are held responsible for all of the work of the courses in which they are registered, and all absences must be excused by the instructor before provision is made to make up the work missed.

Credit—Credit is given only after completion of registration in a course and satisfactory completion of the required work, or upon the assignment of advanced standing in accordance with the regulations of the school concerned. Credit that has been applied to the completion of a degree may not subsequently be applied to another degree.

Auditing—A person who has been admitted to the University may be registered, with the permission of the instructor, as an auditor in a class (no academic credit). An auditor is not required to take active part or to pass examinations. A student who takes a course as an auditor may not repeat it later for credit. Tuition is charged at the prevailing rate. Under no circumstance may a student change from audit status to credit status or vice versa after the end of the eighth week of classes.

Post-Admission Transfer Credit—Students who plan to attend another institution and apply credit so earned toward graduation from this University must first secure the written approval of their dean. In no event will credit in excess of what might be earned in a similar period in this University be recognized.

Transcripts of Record—Official transcripts of student records are issued upon written request of the student or former student who has paid all charges, including any student loan installments, due the University at the time of the request. A nominal fee is charged for each official transcript. Unofficial copies of transcripts are available to students, by written request, at a nominal fee. Partial transcripts are not issued. Students have access to their unofficial student record through the GWeb Information System.

Student Conduct—All students, upon enrolling and while attending The George Washington University, are subject to the provisions of the *Guide to Stu-*

dent Rights and Responsibilities, which outlines student freedoms and responsibilities of conduct, including the Code of Student Conduct, and other policies and regulations as adopted and promulgated by appropriate University authorities. Copies of these documents may be obtained from the Office of the Dean of Students or from the offices of the academic deans. Sanctions for violation of these regulations may include permanent expulsion from the University, which may make enrollment in another college or university difficult. Regulations or requirements applicable only to a particular program, facility, or class of students may not be published generally, but such regulations or requirements shall be published in a manner reasonably calculated to inform affected students.

Right to Dismiss Students—The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

Right to Change Rules and Programs—The University reserves the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine. The right is reserved by the University to make changes in programs without notice whenever circumstances warrant such changes.

University Policy on the Release of Student Information—The Family Educational Rights and Privacy Act (FERPA) applies to institutional policies governing access to and release of student education records.

The University may release the following directory information upon request: name, local address including e-mail, and telephone number; name and address of emergency contact; dates of attendance; school of enrollment; field of study; enrollment status; credit hours earned; degrees earned; honors received; participation in University-recognized organizations and activities (including intercollegiate athletics); and height, weight, and age of members of athletic teams, as well as likenesses used in University publications. A student who does not wish such directory information released must file written notice to this effect in the Office of the Registrar.

The University's full policy statement on the release of student information is published in the *Guide to Student Rights and Responsibilities*, available in the Office of the Dean of Students or the offices of the academic deans. The full statement also appears in the *Schedule of Classes* and on the Registrar's Office website.

Student Identification Number/Social Security Number—The George Washington University uses the Social Security Number (SSN) to identify records pertaining to individual students, as well as to identify the student for purposes of financial aid eligibility and disbursement and repayment of financial aid and other debts payable to the University. The SSN is required when applying for financial aid. The Internal Revenue Service requires the University to file information that includes a student's SSN and other information such as the amount paid for qualified tuition, related expenses, and interest on educational loans. This information is used to help determine whether a student, or a person claiming a student as a dependent, may take credit or deduction to reduce federal and/or state income taxes. Many efforts are made to protect the privacy of this number, and a student may request an alternate personal identifier. Further information may be obtained by contacting the Office of the Registrar.

Property Responsibility—The University is not responsible for the loss of personal property. A Lost and Found Office is maintained on campus in the University Police Office.

The Schools

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Dean W.J. Frawley
Associate Deans F.C. Arterton, P.B. Duff, D.L. Lipscomb, M. Moses
Assistant Deans K.Z. Keller, N. Mikhalevsky

Since its founding in 1821, Columbian College, the original college of liberal arts and sciences of The George Washington University, has been the cornerstone of the campus community. Columbian College of Arts and Sciences today houses all undergraduate and graduate programs in the arts and sciences, offering bachelor's, master's, and doctoral degrees.

The rich and diverse arts and sciences curriculum is designed to strengthen the student's ability to analyze the social, cultural, and physical environment and to communicate findings in an articulate fashion. These purposes are accomplished by means of the study of various disciplines within the humanities, the social sciences, and the mathematical and natural sciences. Students may elect one of 50 departmental or interdisciplinary majors; they may also elect double majors or individualized degree programs. Dean's Seminars constitute a set of courses available only to first-year Columbian College students; the seminars offer a focused introduction to issues of particular significance.

The College offers its undergraduates opportunities for pre-professional education in many fields and for internships in a stimulating urban environment. Special curricular guidance is given to students planning to apply to a medical or law school.

The Bachelor's Degrees

Columbian College offers undergraduate programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Fine Arts. In cooperation with the School of Medicine and Health Sciences, a Seven-Year Integrated Bachelor of Arts/Doctor of Medicine is offered as well.

One hundred twenty hours of course work must be passed and a grade-point average of at least 2.0 maintained. Note that some courses outside Columbian College (notably exercise and sport activities courses) do not count toward the 120-credit requirement. General curriculum, major, and other requirements described below must be met.

Each student must declare a major during the sophomore year. A student will normally declare a major in the third full-time semester but not later than the registration period during the fourth full-time semester or the semester following completion of 45 credit hours, whichever comes first. A student may change the major with the consent of the dean and of the department or committee concerned; the student must meet the requirements for the new major in effect at the time the change is approved. At least 60 hours of course work must be taken outside the major-field department or major program. (This does not apply to the Bachelor of Fine Arts curriculum.)

See Scholarship Requirements under University Regulations for an explanation of how the grade-point average is computed. See Scholarship Performance in the Major, below, for requirements applicable specifically to major programs.

All students, including those transferring from other institutions or from another school or division of this University, with major requirements wholly or substantially met, must satisfy the residence requirement of Columbian College stated below.

Residence

Students must complete 45 of the final 60 hours toward the degree in residence in the Columbian College, including at least 12 hours of course work at the 100

level in the major field. (Students who study abroad must complete 45 of their final 75 hours in residence.) Nine of the final 15 hours must be completed in residence. Courses applicable to the degree taken while registered in any division of The George Washington University in the semester or summer sessions immediately prior to admission to degree candidacy in Columbian College are counted as courses in residence.

Advising

Students have the responsibility for determining their schedules and meeting degree requirements. Because faculty and staff advisors can help students learn to make well-informed choices, students are required to meet with an advisor prior to registering each semester. A CCAS advising hold prevents registration until students have consulted with their advisors.

Freshmen entering Columbian College participate in an advising system designed to provide students ready access to a knowledgeable member of the faculty. All freshmen register for CCAS 10, Proseminar for Scholarship and Advising; each section of the course is led by a faculty member who serves as the academic advisor until the student declares a major. The proseminar is required for all new freshmen; it will be graded, but only with the grades of *P* or *NP*; the course does not count toward the 120 credits required for the B.A., B.F.A., or B.S.

Once students declare their major, they are advised by the faculty of their major department. Transfer students without declared majors are advised in the College's Student Services Center, while those with majors are advised by their major department. Professional advisors are available year-round in the College's Student Services Center for academic assistance and for an accurate appraisal of procedural issues that may arise in any student's program of study.

Specialized advising for students interested in health professions or law is also provided in the College's Student Services Center.

Personal counseling is available through the office of the Dean of Students, the Counseling Center, Disability Support Services, the Multicultural Student Services Center, and the International Services Office.

Students concerned about their academic performance should see their professors, their proseminar advisor, or a professional advisor in the College's Student Services Center. First-year students who receive any grade of *C*− or lower in the first eight weeks must meet with their proseminar advisor to review their academic progress. The Writing Center in the English Department offers walk-in and by-appointment assistance; peer tutors and study skills workshops are available through the Counseling Center.

Academic Work Load

To encourage academic performance of high quality, the College limits the student's work load. After the freshman year, a full-time student who is not on probation may take a course load of up to 18 credit hours. The 18th and all subsequent hours require additional tuition charges. A full-time student who, during the immediately preceding semester, has received no grades below *B*− and has earned grades of *A* or *A*− in three courses totaling at least 9 credit hours may take 21 credits. Under no circumstances may students register for more than 21 credits. Students registered for 12 to 15 credits should be employed for no more than 20 hours per week. The number of credits students on probation may take is determined by the Student Appeals Committee.

Academic Standing

A student who is not suspended or on probation is considered to be in good standing.

The following rules governing probation and suspension are applicable to students enrolled for a full-time program (12 credit hours or more) during the fall or

spring semester. Students enrolled for fewer than 12 credit hours during the fall or spring semester and students enrolled during the summer sessions are subject to probation or suspension on the basis of their cumulative record, a "semester" considered as the time interval in which at least 12 credit hours have accrued.

Probation—A student whose cumulative grade-point average is below 2.0 but above 1.0 after attempting a minimum of 24 credit hours is placed on probation. The course load of a student on probation may be no more than 13 credit hours. A student returns to good standing if, after a first or second semester on probation, the grade-point average is raised to 2.0 or more. A student still on probation after two semesters (or 24 additional credit hours attempted) ordinarily will be suspended but may be continued on probation by the Student Appeals Committee (see below).

Suspension—The following circumstances constitute grounds for suspension: (1) a cumulative grade-point average below 1.0 after attempting a minimum of 24 credit hours; (2) failure to attain a cumulative grade-point average of 2.0 or more after two successive full-time semesters (or 24 additional credit hours attempted) on probation. The Student Appeals Committee may continue a student on probation (in lieu of suspension) if satisfactory progress is demonstrated during the probationary period and sufficient evidence of academic promise, by way of a statement of appeal, is offered by the student.

Once suspended, students may not register for or complete any courses at The George Washington University. Suspended students may apply for readmission following completion of the term of suspension. Final dates for applying for readmission are the same as those governing undergraduate admission (see Admissions). A suspended student seeking readmission must submit evidence to the Student Appeals Committee of conduct during absence from the University that indicates that the student will profit from readmission. A student suspended twice for poor scholarship will not be readmitted.

Semester Warning—A student whose cumulative grade-point average is less than 2.0 after attempting a minimum of 12 credit hours will be issued a warning notice at the end of the semester and will be required to take corrective measures (e.g., limitation of course load to no more than 13 credit hours).

Mid-semester Warning—When, at the end of the eighth week of each semester, instructors submit to the Student Services Center the names of freshmen who are doing unsatisfactory work, a notice of warning is sent to the student and a copy filed with the appropriate advisor. A warning constitutes notice to the student to consult the instructor and advisor at the earliest opportunity.

Timely Progress Toward the Degree

Students who fail to make adequate and timely progress toward the degree, through repeated leaves or repeated failure to complete an appropriate number of credits per semester, may be dismissed from the University (see Right to Dismiss Students under University Regulations). Students dismissed on these grounds may apply for readmission after supplying sufficient evidence of academic promise.

Dean's List and Dean's Commendation List

The name of any student who completes 15 credit hours or more of graded course work in any one semester and attains a semester grade-point average of 3.5 or more with no grades below *B*− will be placed on the Dean's List for that semester. A course taken on a Pass/No Pass basis beyond the 15-hour minimum does not affect the student's eligibility for the Dean's List, nor are the credit hours of such a course computed in the above figures. However, a grade of No Pass in a credit-bearing course disqualifies the student from the Dean's List.

The name of any part-time student who achieves a cumulative grade-point average of 3.5 or more upon completion of 30, 60, and 90 credit hours and upon graduation will be placed on the Dean's Commendation List.

Incompletes

Conditions under which the symbol *I* (Incomplete) may be assigned are described under University Regulations. In Columbian College, the conditions for granting a notation of *I* should be documented by a written contract between the faculty member and the student. Contracts must be on official Columbian College forms and a copy must be on file in the departmental office.

Changing an Incomplete—Incomplete work must be completed as specified in the contract but no later than one calendar year from the last day of the examination period of the semester or summer session in which the symbol *I* was assigned. In cases of well-documented extenuating circumstances, an instructor and a student may jointly petition the dean for additional time in which to complete the work of the course. Such petitions should be submitted within a year of the assignment of the symbol *I*. When work for the course is completed, the grade earned will be indicated in the form of *I*, followed by the grade. The indication of *I* cannot be removed from the transcript. An Incomplete that is not changed within this period automatically becomes an *IF*. The symbol *I* cannot be changed by reregistering for the course here or by taking its equivalent elsewhere.

Pass/No Pass Option

A junior or senior student in Columbian College who is in good standing may, with the approval of the advisor and the dean, take one course a semester for a grade of *P*, Pass, or *NP*, No Pass. No student will be allowed to take more than four pass/no pass courses under this regulation. The student may, however, also receive grades of *P/NP* in proseminars for certain majors and in other courses in which these grades are assigned. Courses required for the College's general curriculum requirements or in the student's major or minor field (including those courses required for the major that are offered by other departments) may not be taken on the pass/no pass basis. A transfer student may not choose this option until the second semester of enrollment in this University. Under no circumstances may a student change from pass/no pass status to graded status, or vice versa, after the end of the eighth week of class.

Earning an Additional Hour of Credit

In exceptional circumstances and with the prior approval in writing of the instructor and the dean, a student may register for and earn an additional hour of credit in certain appropriate 100-level courses within the College by doing a significant amount of extra work as assigned and supervised by the instructor.

Tutorial Study

A junior or senior of demonstrated capacity, with a special interest in the subject matter of a regularly listed course, may be permitted to take tutorial study in residence under the personal direction of the instructor, in accordance with the rules of the appropriate department and with the approval of the dean. Credit under this plan is limited to the specific hours of credit designated for each course in the list of courses of instruction. It assumes frequent and regular conferences between the student and instructor.

Service–Learning Program

A maximum of 6 credit hours in the Service–Learning Program course may be credited toward bachelor's degrees in Columbian College. Students must have a GPA of 3.0 or higher and may not take this course until completion of the freshman year. Students must meet with the SLP coordinator in the Student Services Center to review policy and procedures and the nature of their specific proposal.

Courses Outside Columbian College

No more than 18 credit hours of courses in schools of the University other than Columbian College may count toward the 120 credits required for graduation with a bachelor's degree in Columbian College. Pursuing a secondary field may increase the 18-hour limit, with prior permission of the dean of Columbian College. No credit toward the degree is allowed for exercise and sport activities courses. No more than 45 credit hours of courses completed by a student while in nondegree status in the Office of University Students may be applied toward a degree in Columbian College.

Naval Science—For information on naval science courses and the Naval Reserve Officers Training Corps, see Naval Science, under Courses of Instruction. Note that not all Naval Science courses count toward the 120 credit hours required for the degree in Columbian College.

Placement, Waiver, and Credit Examinations

Preliminary Placement Examinations

All foreign language departments require students to take placement tests to determine the level of proficiency or eligibility for languages studied in high school. The student is placed in an appropriate course on the basis of these tests. Students may not register for a course other than that determined by the placement test without written permission of the language department. There is no charge to the student for placement tests, and no credit (advanced standing) is awarded for courses bypassed or waived as a result of these tests.

Students who wish to register in Math 20, 31, or 51 are required, prior to registration, to take a placement examination or to have achieved indicated scores on the SAT II in mathematics.

Earning Credit by Examination

Assuming there is no duplication of course credit earned, a maximum of 30 credit hours may be assigned for any combination of the following:

College Board Advanced Placement Tests—See Admissions. Credit may be granted for college-level courses taken in an approved secondary school if substantiated by satisfactory performance on the Advanced Placement Tests.

College Board College-Level Examination Program (CLEP)—See Admissions.

Special Departmental Examinations—A student may request any department of Columbian College to offer a special examination covering the subject matter of any specific course. The student must offer evidence of sufficient background to have a reasonable command of the subject matter. Departments reserve the right to deny such requests. Assigning credit by special departmental examinations will depend on the department's evaluation of the examination paper. These examinations will normally be of at least three hours' duration. A fee is charged for preparation, administration, and grading of each course examination. Credit by special departmental examination is not permitted for the first two years of college-level courses in a native language other than English. A student who has previously taken examinations to waive course requirements may not subsequently take examinations for credit in the same courses.

Waiving Introductory Courses by Examination

Some departments in Columbian College, including English and History, offer periodic waiver examinations for introductory courses. Such examinations may be attempted at the option of the student; a fee is charged. Specific departments should be consulted for further details. Passing a waiver examination does not entitle a student to any credit toward the degree.

General Curriculum Requirements

With the exception of entering students in the College's School of Media and Public Affairs, all candidates for the degree of Bachelor of Arts or Bachelor of Science are admitted to a general arts and sciences curriculum until they declare a major field. Bachelor of Fine Arts candidates are admitted directly into the departmental curriculum.

General curriculum requirements are established by the Arts and Sciences faculty as a whole and administered through its elected committees. Students must demonstrate that they have acquired familiarity with the breadth and diversity of the arts and sciences. Students will typically fulfill these requirements by taking the required number of GW courses in seven categories. Excluding the University Writing and Writing in the Discipline courses (see below), students may also fulfill these requirements in the following ways: (1) transfer credit for equivalent courses from an accredited institution; (2) credit earned by means of AP, IB, or other nationally approved examination programs; (3) waiver examinations such as SAT II or ACT subject tests. (See Advanced Standing and Advanced Placement under Admissions in this Bulletin, and note that waiver exams do not satisfy the Foreign Languages and Cultures requirement.) The seven categories are listed below. Excluding courses designated Writing in the Discipline, no course may fulfill a requirement in more than one of the seven categories. The description of each category includes a rationale. The Student Services Center maintains a list of courses appropriate for freshmen.

1. *Literacy*

Students take University Writing 20 (4 hours) in their freshman year plus two courses designated as Writing in the Discipline (6 hours) before graduation, preferably in their sophomore or junior years. For the academic world and beyond, students develop their ability to write effectively and to read analytically.

2. *Quantitative and Logical Reasoning*

Students must take two courses (6 hours) from the fields of mathematics, logic, or statistics. (Note that Math 3 and 6 are considered remedial and do not satisfy this requirement. Two statistics courses or two mathematics courses that are related in subject matter may not be taken; see the notes preceding the course lists under Statistics and under Mathematics in the Courses of Instruction section of this Bulletin.) Argumentation and quantitative evidence play important roles in social discourse. Students enhance their capacity to think logically and critically and to reason symbolically or with numerical data.

3. *Natural Sciences*

Students must take three courses with laboratories (9–12 hours) in at least two of the following fields: biology (including biological anthropology), chemistry, earth and environmental sciences, and physics (including astronomy). The health, security, and economic well-being of our society are linked to a scientifically literate citizenry. Students explore the fundamental principles of the natural world and see how the tools of science—careful observation and experimentation—not only help develop technology but also lead to a deeper understanding of the universe.

4. *Social and Behavioral Sciences*

Students must take two courses (6 hours) in one or more of the following fields: anthropology (except biological anthropology), communication, economics, geography, linguistics, media and public affairs, political science, psychology, speech and hearing science, and sociology (including human services). Structures and processes in society and personality shape public events and the behavior of individuals and groups. Students explore empirical results in the literature and the implications of these results for social and behavioral issues, thereby gaining an appreciation for theory and methods of analysis, evidence, and proof.

5. *Creative and Performing Arts*

Students must take 3 credits in one of the following fields: fine arts, creative writing, dance performance, electronic media performance, applied music (jazz

performance, a single instrument, or a single ensemble), and theatre performance. Imagination and its expression play an important part in the cultural life of a society. Through courses that require participation in a creative or performing art, students gain insight into the interactions among materials, talent, and imagination, and develop sensitivity to the diverse elements involved in the arts.

6. *Humanities*

Students must take four courses (12 hours) in at least two of the following fields: American studies, classical studies, literatures in English, foreign literatures in their original language and in translation, history (including the history and appreciation of art, dance, music, film, and theatre), humanities, philosophy (except logic), religion, and women's studies. The humanities express the ideas, aspirations, and values of individuals and the societies in which they live. Through courses in the humanities, students experience the richness of ideas, traditions, and stories that have shaped the world.

7. *Foreign Languages and Cultures*

Students must take two courses (6–8 hours) in one language other than English, beginning at the level at which they place, or students must take two courses (6–8 hours) in aspects of foreign, non-English speaking cultures from the fields of anthropology, art history, classical and Semitic languages and literatures, East Asian languages and literatures, German and Slavic languages and literatures, geography, history, humanities, international affairs, music, political science, religion, and women's studies. In our increasingly multicultural society, familiarity with a second language or another culture is important to understanding ourselves in relation to the world. Students must study a second language or other cultures in order to help develop this understanding, to facilitate communication across cultural and national boundaries, and to gain an appreciation for cultural diversity. For those who choose the foreign cultures option, courses must be selected from the following: Anth 170 to 175, 177 to 179, 185, 186, 188; Clas 71, 72, 81, 82, 100, 101, 117 to 120; Chin 136, 161, 163, 164; Japn 111, 112, 162; Kor 111, 112; AH 101, 102, 104, 105, 112 to 114, 119, 121, 122, 147, 155, 187, 188, 193; Geog 154, 161, 164, 165; Ger 91, 92, 161, 162, 165; Slav 91, 92, 151, 152, 161, 162, 165, 166, 185, 186; Hist 107 to 115, 118, 131, 132, 141 to 146, 148, 149, 158, 159, 161 to 165, 187, 189, 190, 193 to 196; Mus 7; PSc 130, 131, 170, 173, 176, 177, 179 to 181, 183; Rel 106, 107, 112, 113, 115, 156 to 161, 163 to 165, 771; WStu 136. The Student Services Center periodically updates the list of approved courses.

The Major

In order to declare a major, all students must receive academic guidance from a faculty advisor in the major department and submit a Declaration of Major form, signed by the major advisor, to the Student Services Center. The Declaration of Major form must be submitted no later than the registration period during the student's fourth full-time semester or the semester following the completion of 45 credit hours (whichever comes first). No student is considered to have declared a major until this process is completed. Thereafter, the student receives academic guidance from a faculty advisor in the major department. In most cases, filing of the approved declaration form assures the student of admission to the major declared; however, if space, equipment, or other requirements compel a department or major program to limit the number of students in that major, admission to the major may be on a selective or space-available basis. Majors that require admission are communication, electronic media, journalism, political communication, and English and creative writing. Once students declare their major, they must receive academic guidance from a faculty advisor in the major department in order to register for all subsequent semesters.

A change in degree candidacy within Columbian College (e.g., from Bachelor of Arts to Bachelor of Science) requires the permission of the dean. The degree requirements effective at the time the change is approved must be met.

Major Fields

All fields listed below (except Applied Mathematics, Biological Anthropology, Biophysics, Environmental Science, and Statistics) may lead to the Bachelor of Arts degree; a Bachelor of Science degree may be elected in those fields indicated by an asterisk.

American Studies
Anthropology
*Applied Mathematics
Archaeology
Art History
Art History and Fine Arts
*Biological Anthropology
*Biology
*Biophysics
*Chemistry
Chinese Language and Literature
Classical Humanities
Communication
Criminal Justice
Dance
Dramatic Literature
Early Modern European Studies
*Economics
Electronic Media
English
English and Creative Writing
*Environmental Science
Environmental Studies
Fine Arts
French Language and Literature
Geography
*Geoscience
German Language and Literature
Hispanic Languages and Literatures
History
Human Services
Japanese Language and Literature
Journalism
Judaic Studies
Mathematics
Music
Philosophy
*Physics
Political Communication
Political Science
Program in the Liberal Arts
Psychology
Religion
Russian Language and Literature
Sociology
Speech and Hearing Science
*Statistics
Theatre
Women's Studies

Scholarship Performance in the Major

Majors are defined in terms of credit hours, required courses, and the attainment of grades no lower than *C*− in the minimum number of 100-level courses required in the major field. If a student receives a grade of *D*+, *D*, or *D*− in a 100-level course specifically required in the major, the major department or program may permit the course to satisfy a curricular requirement even though it would not normally count toward the minimum number of hours required for the major. However, the department or program may instead require the student to repeat the course until a satisfactory grade (*C*− or better) is earned. (The department chair or program director must authorize such repetition in a memo to the Student Services Center before the student may register a second time.) Once the student has completed the course with a satisfactory grade, credit hours earned the first time the course was taken will count toward the minimum number of hours required in the major. Credit earned for the repetition will not count toward the degree. The minimum specific requirements for majors are listed under the department concerned in Courses of Instruction. The chair of the department, or designated departmental advisor, should be consulted before registration concerning the student's program of courses; the entire program, including electives, must be approved by the department. The student is also expected to consult a departmental advisor in all matters affecting the program of studies, such as changes, substitutions, withdrawals, or transfer of credit from other institutions.

Some majors require satisfactory completion of entry, proficiency, or concluding examinations in addition to courses.

Double Majors

A student who completes the requirements of two major fields in Columbian College (for example, mathematics and physics, or history and economics) may graduate with a double major. Such a student should consult with advisors in the two departments concerned and officially declare both majors on the Declaration of Major form available in the Student Services Center. A Columbian College student may pursue two majors at the same time, even though one is toward a B.A. and the other is toward a B.S. A major field in Columbian College cannot be combined with a major field offered by another degree-granting unit of the University, with the exception of the Elliott School of International Affairs and the School of Engineering and Applied Science.

A Columbian College student (whether in a B.A. or B.S. program) may pursue a second major in the Elliott School of International Affairs or the School of Engineering and Applied Science, provided that permission to do so has been obtained from the appropriate administrative office of the Elliott School or SEAS. Students in the Elliott School or SEAS may also take a second major (excluding majors in communication, electronic media, journalism, political communication, and English and creative writing) in Columbian College; students in the Elliott School may pursue a B.A. major in Columbian College, while students in SEAS may pursue either a B.A. or B.S. major in Columbian College.

Students wishing to pursue one of these options must request approval through the appropriate department and the Columbian College's Student Services Center. In all cases, students must complete the major in their own school in order to graduate. A second major in the Elliott School or SEAS may supplement the Columbian College major but may not substitute for it.

Interdisciplinary Programs

Special Interdisciplinary Programs—A student may propose a special interdisciplinary major program, in consultation with appropriate academic advisors. The proposed program must have valid and clearly defined academic goals to be considered for approval. Only students with a *B* average or better are eligible to propose a special interdisciplinary program. The proposal must be submitted for approval by the end of the fourth semester or the semester following completion of 45 credit hours (whichever comes first).

Approval of the proposed program rests with the Student Appeals Committee, which must also approve the proposed name of the program and the composition of the committee that will oversee it. At least 45 credit hours of the program must be completed in Columbian College. Because of the broad scope of an interdisciplinary program, it may not be part of a double major.

At the discretion of the committee overseeing the program, the student must either write an acceptable senior thesis or pass a comprehensive examination in the last semester of study toward the degree.

Program in the Liberal Arts—This program is designed to provide a general education in the liberal arts, with or without another major, as the student chooses. It offers opportunity for achieving a substantial acquaintance with each of the three divisions of knowledge through a selection of courses that cultivate a broad perspective in the fundamental divisions of the arts and sciences. For curriculum requirements, see Liberal Arts, under Courses of Instruction.

Minors and Secondary Fields

Minors

Students who wish to familiarize themselves with a field outside their major may graduate with a minor in addition to the major. Not all Columbian College

departments offer undergraduate minors; the requirements prescribed by those that do are listed under the department concerned. A student interested in a minor should consult a faculty advisor in the department concerned and declare both major and minor programs on the Declaration of Major form available in the Student Services Center.

At least one-half of the course work required for a minor must be done in residence. Grades of *C*– or better must be earned in 100-level courses, including such courses transferred as advanced standing from another institution. Courses passed with a grade below *C*– may be used to fulfill a minor field curricular requirement but may not be counted toward the total number of credit hours required for the minor.

When taken by a student enrolled at the University in a school other than Columbian College, such minors are designated secondary fields. The same curricular and scholarship requirements apply to secondary fields as to minors.

Undergraduates in other schools of the University may pursue major requirements to earn a secondary field when there is no appropriate minor.

Minors are available in the following fields:

Africana Studies
American Studies
Applied Ethics
Archaeology
Art History
Art History and Fine Arts
Biological Anthropology
Biology
Chemistry
Chinese Language and Literature
Classical Humanities
Communication
Creative Writing
Criminal Justice
Cross-Cultural Communication
Dance
Early Modern European Studies
Economics
Electronic Media
English
Film Studies
Fine Arts
French Language and Literature
General Anthropology
Geographic Information Systems
Geography
Geoscience
German Language and Literature
Hispanic Languages and Literatures
History
Human Services
Italian Language and Literature
Japanese Language and Literature
Jazz Studies
Journalism
Judaic Studies
Korean Language and Literature
Linguistics
Mathematics
Music
Organizational Communication
Organizational Sciences
Peace Studies
Philosophy
Physics
Political Science
Psychology
Religion
Russian Language and Literature
Sociocultural Anthropology
Sociology
Speech and Hearing
Statistics
Theatre
Women's Studies

Secondary Fields

Just as students enrolled at the University but outside the College may pursue Columbian College minors as secondary fields, such study is permitted Columbian College students in other schools of the University. Secondary fields are available in the School of Engineering and Applied Science, the School of Business, the School of Medicine and Health Sciences, the School of Public Health and Health Services, and the Elliott School of International Affairs. Columbian College students are limited in the number of hours they may take in courses outside the College ("professional credit" courses). Refer to Courses Outside Columbian College, above.

Preparation for Medical School

A student who plans to apply to medical school fulfills the general requirements of Columbian College stated above and may select any major in Columbian College. Advice about academic preparation for medical school is provided by the health professions advisor in the Student Services Center. For admission to most medical schools, the student must have a minimum of 90 credit hours applicable toward a degree in an approved college of arts and sciences; the 90 hours must include:

Biology—8 credit hours, including laboratory. This may be either in general biology or zoology but may not include separately credited courses in botany.

Chemistry—8 credit hours of general inorganic chemistry (which may include qualitative analysis), including laboratory, and 8 credit hours of organic chemistry, including 2 hours of laboratory.

Physics—8 credit hours, including laboratory.

English—6 credit hours in the usual introductory English composition courses or their equivalents (fulfilled by the University Writing Program at GW).

Many medical schools have additional entrance requirements, which may include courses in biochemistry, genetics, and mathematics. Even when such courses are not required, they are strongly recommended.

With the exception of these specific requirements, applicants are urged to follow their personal interests in developing their course of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged.

Seven-Year Integrated Bachelor of Arts/Doctor of Medicine

In addition to the early selection program described under the School of Medicine and Health Sciences, the University offers a seven-year integrated B.A./M.D. program. The program has been designed for students of high ability and maturity who have decided, before applying to college, that they wish to become physicians and want to accomplish that goal in a shorter amount of time. Detailed information on this program is available through the College.

Preparation for Law School

Because a broad liberal education is the best undergraduate preparation for law school, Columbian College does not prescribe a prelegal curriculum. Advice about academic preparation for law school is provided by the pre-law advisor in the Student Services Center.

Second Bachelor's Degree

Columbian College graduates who wish to receive a second bachelor's degree following graduation must satisfy the general College requirements and the requirements of their new major and degree and must complete 30 hours in residence in Columbian College. Students with undergraduate degrees from other institutions or from other divisions of the University, if admitted to the College, must meet the same set of requirements.

SCHOOL OF BUSINESS

Dean S. Phillips
Senior Associate Dean P.K. Bagchi
Associate Deans D.R. Sheldon, W.R. Baber

Organized as the School of Government in 1928, the School of Business has been responsible for over half a century for the professional development of individuals assuming leadership roles in society. The School comprises seven departments—Accountancy, Finance, International Business, Management Science, Marketing, Strategic Management and Public Policy, and Tourism and Hospitality Management. The use of a multidisciplinary approach in educational programming helps prepare both the generalist and specialist for professional careers in today's complex, organizational society.

The School of Business is a member of AACSB International–The Association to Advance Collegiate Schools of Business, and its undergraduate and graduate programs are accredited by the Association.

Vision—To be a preeminent business school recognized for scholarly research, teaching excellence, and innovative curricula focused on the responsible management of organizations in the global environment.

Mission—To deliver an outstanding education, advance knowledge, and provide practical experience in diverse organizational settings, leveraging the unique advantages of our location in the Washington, D.C., area, in order to enhance the capacities of students, faculty, staff, alumni, and the business community to be productive and principled members of society.

Values—Integrity: demanding transparency, accountability, and ethical behavior; leadership: encouraging problem solving, commitment, and entrepreneurship; scholarship: emphasizing discovery, learning, and innovation; service: responding to the needs of students, academic professions, and the community; relationships: fostering communication, collaboration, and collegiality.

The Bachelor's Degrees

The School offers programs leading to the degrees of Bachelor of Accountancy and Bachelor of Business Administration. The programs include foundation knowledge for business in accounting, behavioral science, economics, mathematics, and statistics. Curricula are designed to provide perspectives on ethical and global issues, the influence of political, social, legal and regulatory, environmental, and technological issues, and the impact of demographic diversity on organizations.

A Bachelor of Business Administration student selects a field of concentration from among business economics and public policy; finance; human resource management; information systems; international business; marketing; sport, event, and hospitality management; or, with faculty approval, may choose to structure an individualized field of concentration reflecting the student's specific interests in management.

Residence

Of the 120 credit hours required for graduation, a minimum of 30 credits, including at least 27 credits in required business or accountancy courses, must be completed while registered in the School of Business. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Unless special permission is granted by the director of the Advising Center to pursue work elsewhere, the work of the senior or final year must be completed in the School of Business. Students who have

successfully completed 75 credit hours at GW may not take courses at a community college.

Academic Work Load

Full-time students in good standing (2.0 overall grade-point average or higher) may register for a maximum of 17 credit hours each semester and 6 credits each summer session. A student employed more than 20 hours a week, who is in good standing, may not take more than 9 credits each semester and 3 credits each summer session. A full-time student on probation may take no more than 13 credit hours of course work; it is strongly recommended that a student on probation not be employed. Full-time students whose overall grade-point average is 3.0 or higher may take up to 18 credits each semester. A student employed more than 20 hours a week, whose grade-point average is 3.0 or higher, may take up to 12 credits. A student who accepts employment after registration or at any time during a semester must report immediately to the director of the Advising Center so that the program may be adjusted if necessary. Exceptions to these rules require the approval of the director of the Advising Center.

Scholarship Requirements

A student must have the following to graduate: (1) a minimum of 120 credit hours; (2) an overall grade-point average of at least 2.0; and (3) a grade-point average of at least 2.0 in all required 100-level B.B.A. or B.Accy. courses and field-of-instruction–related courses (the major field grade-point average). All courses taken at The George Washington University are included in the overall grade-point average calculation. Elective courses in or out of the School of Business cannot be used as substitutes for required courses in the calculation of the major field grade-point average.

Probation—A student whose grade-point average (either overall or in the major field) falls below 2.0 after completing a minimum of 12 credit hours of study will be placed on probation. Probation by overall grade-point average normally extends over the period in which the student attempts another 12 credit hours of work, which may include remedial studies as prescribed. In those cases in which a student chooses to take a lighter load during the probationary semester, performance will be reviewed at the end of the semester and the student may be suspended at that time. Incomplete grades are not allowed during the probation period. Probation by major field normally extends over the period in which the student attempts 6 credit hours of study in major field course work.

Suspension—A student whose grade-point average (either overall or in the major field) is 1.5 or below in any semester or remains below 2.0 at the end of the probationary period will be suspended. Any outstanding Incomplete grade at the time of suspension must be completed or will turn to an administrative *F*. A student suspended for poor scholarship may apply for readmission after the end of the fall or spring semester following the term of suspension. To be considered for readmission, the student must submit evidence of remedial activity performed during the suspension period and evidence of renewed potential ability to do college-level work. No advanced standing will be assigned for academic work completed while the student is suspended, but the student may petition the director of the Advising Center for consideration of advanced standing after completing a minimum of 12 credit hours of course work here and achieving a cumulative and major field grade-point average of at least 2.0.

A student readmitted after suspension is on probation (see above) and must maintain a current grade-point average determined by the director of the Advising Center until the cumulative and major field grade-point averages are at least 2.0. In no case will the overall probationary period after readmission ex-

ceed 24 credit hours of study or the major field probationary period exceed 12 credit hours of study. A student suspended twice for poor scholarship will not be readmitted.

Semester Warning—Any student whose overall or major grade-point average falls between 2.0 and 2.2 will be placed on warning. Though the student's courses will not be restricted, progress during the semester will be monitored. It is the student's responsibility to meet with an assigned advisor during the semester.

Mid-Semester Warning—If a professor files an evaluation showing that a student is doing unsatisfactory work (*C–* or below), the director of the Advising Center will inform the student in writing of his or her status. This notice constitutes an official direction to consult with the professor and advisor immediately.

Grade of F—A grade of *F* earned in any course completed at GW remains a part of the student's record and is calculated into the grade-point average, even after the course is retaken.

Pass/No Pass Option

A junior or senior student who has a cumulative grade-point average of 2.5 or better may, with the approval of the advisor and the director of the Advising Center, take one upper-level non-business or unrestricted elective a semester and receive a grade of *P,* Pass, or *NP,* No Pass, which will be recorded on the student's transcript but will not be reflected in the grade-point average. No student will be allowed to take more than four pass/no pass courses,with a limit of one per semester. Under no circumstances may a student change from pass/no pass status to graded status, or vice versa, after the last date to withdraw from a course (except in the case of a prerequisite to Math 51, exercise and sport activity, or applied music courses). Required courses may not be taken on the pass/no pass basis, with the exception of BAdm 1 and 2. A transfer student may not choose this option until the second semester of enrollment in the University.

Incompletes

Conditions under which the grade of *I* (Incomplete) is assigned are described under University Regulations. The grade of *I* must be changed by a date agreed on by the instructor and the student but no later than the last day of the examination period for the fall or spring semester immediately following the semester or summer session in which the grade of *I* is assigned. An Incomplete that is not changed within this period automatically becomes an *IF.* In cases of well-documented extenuating circumstances, an instructor and a student may jointly petition the director of the Advising Center for additional time in which to complete the work of the course. Such petitions should be submitted within the same period. The grade of *I* cannot be changed by reregistering for the course here or by taking its equivalent elsewhere. The *I* notation remains on the student's permanent record even after the course has been successfully completed.

Dean's Honor List

The names of students who achieve a grade-point average of 3.75 or higher are placed on the Dean's Honor List for that semester. Appearance on the list is limited to (1) full-time students registered for a minimum of 12 credit hours (provided that the 12 hours are taken for a grade) and (2) part-time students registered for a minimum of 12 credit hours over a period of two consecutive semesters, which may include a summer term.

Independent Research Plan

A junior or senior of demonstrated capacity, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal

direction of a regular, full-time member of the faculty, in accordance with the rules of the appropriate department. Credit under this plan is limited to the specific credit hours normally allowed when a course is taken on a class basis. A petition outlining the student's specific study plan must be submitted to the director of the Advising Center prior to beginning any independent study. Generally, a maximum of two independent studies in two separate semesters is permitted.

Earning Credit or Waiving Requirements by Examination

A student may earn credit up to a maximum of 30 credit hours or waive curricular requirements by performing satisfactorily on the following tests:

College-Level Examination Program (CLEP)—See Admissions for general information on the CLEP tests. CLEP tests in Introduction to Business and Fundamentals of Business Law are limited to 1.5 credits each of advanced standing. CLEP tests in general mathematics, college algebra/trigonometry, English composition, accounting, and more advanced courses in business administration are not accepted for advanced standing. Matriculated students who wish to receive credit for CLEP General and Subject Examinations must receive prior approval, through petition, of their advisor and the director of the Advising Center.

Advanced Placement Tests and Achievement Tests—See Admissions.

Special Departmental Examinations—A student may request any department of Columbian College to offer a special examination covering the subject matter of any specific course. (If an appropriate CLEP Subject Examination is available, the department may choose to employ it.) The student must offer evidence of sufficient background to have a reasonable command of the subject matter. Departments reserve the right to deny such requests. Credit by special departmental examination is not permitted for the first two years of college-level courses in a native language other than English. A student who has previously taken examinations to waive course requirements may not subsequently take examinations for credit in the same courses. Assigning credit (or waiving a requirement) by special departmental examinations will depend on the department's evaluation of the examination paper. These examinations will normally be of at least three hours' duration. A fee for each course examination is charged for preparation, administration, and grading of the examination. A petition must be submitted to the director of the Advising Center prior to taking the examination.

Waiving Introductory Courses by Examination—Several departments in Columbian College, including English and history, offer periodic waiver examinations for introductory courses. Such examinations may be attempted at the option of the student: a fee is charged. Specific departments should be consulted for further details. Passing a waiver examination does not entitle a student to any credit toward the degree.

The Bachelor of Accountancy and The Bachelor of Business Administration

Curriculum for the First Two Years for All B.Accy. and B.B.A. Students

Freshman Year—BAdm 1–2, 66; Econ 11–12; Engl 9 or 10, 11; Math 31–32 or 51–52; a two-course sequence chosen from Astr 1–2, BiSc 3–4 or 13–14, Chem 3–4 or 11–12, EES 1–2, Phys 1–2; one approved elective focusing on a culture or political system other than one's own.

Sophomore Year—Accy 51, 52; BAdm 53, 64, 145; Stat 51 or 53; one elective selected with advisor approval to improve communication skills; one course on moral reasoning selected with advisor approval; three 3-credit restricted electives chosen in consultation with the advisor, at least one of which is in the humanities.

Note: CSci 10, 35, 39, 41, Math 3, 6, 9, 10, 20 (without 21), Educ 180, and ExSA courses may not be used for credit toward the B.Accy. or the B.B.A. If the student places in the first semester of a language previously studied in high school, credit toward the degree will not be granted; however, the second semester of a first-year language course that was studied in high school may be taken as the cultural and political diversity elective. For B.Accy. students, a minimum grade-point average of 2.5 is required at the start of the junior year. For B.B.A. students, the field of concentration must be selected no later than the second semester of the sophomore year.

Curriculum for the Second Two Years for All B.Accy. Students

Junior Year—Accy 121, 122, 151, 161, 192; BAdm 110, 115; three approved 3-credit non-accountancy electives, of which two are chosen outside of School of Business departments.

Senior Year—Accy 171, 181, 193, 196; BAdm 150, 197 (BAdm 197 must be taken at GW); four approved 3-credit 100-level non-accountancy electives, of which one must be in the Department of International Business and two must be chosen outside of School of Business departments.

Curriculum for the Second Two Years for All B.B.A. Students

Junior Year—BAdm 110, 115, 120, 130; one analytical tools course and one field tools course; one course in the field of concentration; three 3-credit 100-level electives chosen in consultation with the advisor (two non-business, one unrestricted).

Senior Year—BAdm 55, 135, 150, 197; three courses from the field of concentration; one field-related elective; three 3-credit 100-level electives chosen in consultation with the advisor (two non-business, one unrestricted).

Fields of Concentration

The field of concentration consists of four field courses and a field elective chosen from a set of courses designated by the department. The field must be selected no later than the second semester of the sophomore year; the student should contact the Advising Center to declare a field. Students may declare two fields, but they should note that this will increase the number of credit hours required to complete the B.B.A. Fields are listed below, followed by the courses that constitute the field. In all cases, students must consult the academic advisor for an appropriate field-related elective.

Business Economics and Public Policy—Econ 101 and 102 or 158; PSc 116 or 118; and, with approval of the advisor, a course chosen from Anth 150, Econ 136 or 181, Geog 120, PubH 180, or PSc 122.

Finance—Fina 122, 123, 124, and either 132 or 135.

Human Resource Management—Mgt 116, 117, and two courses from among Econ 165; Mgt 251, 252, 257; Psyc 144.

Information Systems—Mgt 119, 120, 121, either 123 or a designated section of 190.

International Business—IBus 160 and three additional 100-level IBus courses.

Marketing—Mktg 142, 143, 159, and either 148 or 150.

Sport, Event, and Hospitality Management—TStd 104, 137 or 143, 135 or 144, and 136 or 145.

Individualized Field of Concentration—A student with a minimum GPA of 2.8 and a specific interest in some field of management may design an individualized field of concentration drawing on courses across the University. Past examples of approved individualized fields include emergency response management, media management, and performing arts management. Such a concentration consists of

four courses plus an analytical tools elective, a field tools elective, and a field-related elective selected with the guidance of faculty with expertise in the area of interest. All such individualized fields must be approved in advance through an individualized field review committee. Interested students should discuss their ideas with an advisor.

Secondary Field of Study

A secondary field of study in business administration is available in the School of Business; School of Business students may pursue a secondary field in other GW schools. See the brochure "Secondary Fields of Study," available in the Advising Center.

Students from Other Schools Within the University

Degree candidates from other schools of the University cannot register for more than 21 credit hours in courses from the Bachelor of Business Administration degree program. Typically, a maximum of 6 credit hours is permitted in courses from the Bachelor of Accountancy program, unless an advisor recommends an additional 3 credits.

Five-Year Joint Programs Leading to a B.B.A. and a Master's Degree

The School of Business offers five-year joint programs leading to both a B.B.A. and a master's degree. Students pursue the regular B.B.A. curriculum in their first three years of study; when admitted to the five-year program, students are enrolled in courses at both the undergraduate and graduate levels during the final two years. Students apply for admission to the graduate program after completion of 75 credit hours and must be admitted to the graduate program by the fourth year of study. During the last two years, the student simultaneously completes requirements for the undergraduate and the graduate degree but is not considered a graduate student until the start of the fifth year of study. The two degrees are awarded concurrently; there are no exceptions. Students who choose to discontinue the program at the end of four years will be required to take additional courses to complete requirements for the B.B.A. A full description of the programs, including GPA requirements, can be obtained through the Advising Center.

Bachelor of Business Administration/ Master of Science in Information Systems Technology

Application to the B.B.A./M.S.I.S.T. program requires a minimum 3.2 GPA and is available with a field of concentration in information systems development. Students take Mgt 119 and 121 among the third-year electives.

Fourth Year—BAdm 55, 135, 150, 197; two approved 100-level non-business electives; Mgt 120, 280, 282, 284; one approved graduate elective.

Fifth Year—Mgt 287, 298; four field electives chosen from other M.S.I.S.T. courses; one approved graduate elective.

Bachelor of Business Administration/Master of Tourism Administration

Students in the B.B.A./M.T.A. program take TStd 104 and 143 or 137 among the third-year electives. Students are required to gain at least 500 hours of work experience in the tourism, hospitality, sport, event, or related field if they do not have equivalent previous experience.

Fourth Year—BAdm 55, 135, 150, 197; TStd 144 or 135, 145 or 136, 249, 270, 296; two approved approved 100-level nonbusiness electives; and an approved graduate-level elective.

Fifth Year—12 credit hours in one of the following concentration fields: sustainable destination management, event and meeting management, sport management, or the individualized study option; plus 12 credit hours in approved electives and either TStd 283 and 297 or TStd 299 and 300.

Dual Degree Programs

Dual degree programs leading to the Bachelor of Business Administration and the Master of Public Administration or the Master of Public Policy have been established. Interested students should consult the Advising Center early in the junior year.

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Dean T.W. Tong
Associate Dean R.J. Harrington

The School of Engineering and Applied Science was organized in 1884 as the Corcoran Scientific School of Columbian University. It was named in honor of William W. Corcoran, president of the University's Board of Trustees from 1869 to 1888. The school was among the first to accept women for degree candidacy in engineering. The organization and offerings of the school have evolved over the years, but throughout most of its history the program has been characterized by its emphasis on the principles guiding the advancement of technology.

Through its five departments—Civil and Environmental Engineering; Computer Science; Electrical and Computer Engineering; Engineering Management and Systems Engineering; and Mechanical and Aerospace Engineering—the School of Engineering and Applied Science offers undergraduate study leading to the degrees of Bachelor of Science (with majors in biomedical engineering, civil engineering, computer engineering, computer science, electrical engineering, mechanical engineering, and systems engineering), and Bachelor of Arts (with majors in applied science and technology and in computer science). Five-year bachelor's/master's degree programs are available for selected majors. In cooperation with the Law School, an integrated engineering and law program leading to the degrees of Bachelor of Science or Arts and Juris Doctor is offered. An integrated engineering and medicine program leading to the degrees of Bachelor of Science or Arts and Doctor of Medicine is offered in cooperation with the School of Medicine and Health Sciences. The School offers graduate study leading to the degrees of Master of Science, Master of Engineering Management, and Doctor of Science and to the professional degrees of Engineer and Applied Scientist.

The School of Engineering and Applied Science maintains extensive and varied computing facilities as well as an array of laboratory facilities to support study and research in such areas as general-purpose electronics, computer science, computer engineering, graphics, computer-aided design, robotics and computer-aided manufacturing, computer-aided engineering, artificial intelligence, software engineering, decision support systems, interactive multimedia, power systems, control systems, medical engineering, bioinformatics, combustion diagnostics, fluid mechanics and hydraulics, environmental engineering, propulsion, soil mechanics, thermal sciences and instrumentation, materials science and engineering, thin-film development, and communications, microwaves, and lasers.

SEAS Regulations

Academic Work Load

A full-time undergraduate student who is not on probation may register for no more than 21 credit hours. Students on probation may not register for more than 12 credit hours. A student employed more than 24 hours a week may take no more than 10 credit hours. In exceptional cases these limits may be exceeded with the advisor's permission.

Credit by Examination

Assuming there is no duplication of course work, a maximum of 30 credit hours may be assigned upon admission to the University for any combination of the following.

College Board Advanced Placement (AP) Tests—See Admissions.
College Board College-Level Examination Program (CLEP)—See Admissions.

A student already registered at the University must seek departmental approval before taking a CLEP Subject Examination for credit. Credit may not be

earned by passing the examination after having taken the equivalent course or after having taken a waiver examination for the course.

Department Examinations for Waiver or Credit—Registered SEAS students may also take examinations in some academic departments for waiver of or credit for a specific course upon approval of the appropriate department chair; before the test is administered, the student must have demonstrated sufficient preparation to warrant being given the test. An examination for credit is not allowed if an examination for waiver has been successfully completed or if the student has taken the course.

Makeup of Credit for Waived Courses

Waiver of a required course requires approval of the student's faculty advisor and curriculum coordinator. If a course required by the SEAS curriculum is waived, the corresponding credit hours must be earned by satisfactory completion of a university-level academic course, either technical or nontechnical, approved by the student's faculty advisor. If the substituted course would normally be considered part of the student's curriculum, the grade earned will be used in determining grade-point average, Dean's List, probation, and suspension. If the substituted course would not be part of the student's curriculum, the grade will not be included in the above computations.

Scholarship Requirements

To be eligible for graduation a student must have (1) a grade-point average of at least 2.2 for technical courses in the fifth through eighth semesters of the curriculum and (2) a 2.0 overall average for the program taken at SEAS. All computer science courses taken in the Bachelor of Arts in Computer Science are considered technical for this purpose. Grades used to calculate the grade-point average include all grades earned at George Washington University and through the Consortium universities while the student is enrolled at GW. The grades used are for academic courses taken in fulfillment of degree requirements and not for remedial courses or those taken to make up deficiencies. (For example, EFL courses numbered 45 and below will not be considered for purposes of probation, suspension, or Dean's List.)

Non-SEAS courses taken in excess of the number needed to fulfill degree requirements are not considered in determining probation, suspension, or Dean's List status. Only courses required for the degree program are considered in determining whether the student has met graduation requirements.

Probation

A full-time student will be placed on probation if his or her grade-point average is less than 2.0 for one semester or if he or she receives more than one grade of *F* in one semester or summer session. A part-time student will be placed on probation if his or her grade-point average is less than 2.0 or he or she has received more than one grade of *F* when he or she has accumulated 12 credit hours. For academic purposes, a new grading period will begin once this accumulation is reached.

A student on probation who earns a grade-point average of 2.0 or better (for 12 or more credit hours) during the semester on probation but also receives a grade of *F* will be continued on probation; students in this category who receive two or more *F*s will be suspended.

A full-time student will be removed from probation when the grade-point average is 2.0 or more with no grade of *F* during the semester on probation. A part-time student will be removed from probation when the grade-point average is 2.0 or more and he or she receives no grade of *F* for the next 12 credit hours after being placed on probation.

Suspension

The following cases constitute grounds for suspension: (1) receipt of two grades of *F* any time during a probation period (part-time students receiving two grades of *F* while on probation will be suspended at the time of receipt of the second of these grades); (2) receipt of four grades of *F* in any semester (or the equivalent for part-time students); (3) placement on probation for a third time; (4) accumulation of a grade-point average of (a) 1.5 or less at the end of the sophomore year or upon completion of the 63rd credit in the student's curriculum, (b) 1.9 or less at the end of the junior year or upon completion of the 97th credit in the student's curriculum, or (c) less than 2.0 at any time during the senior year.

Department faculty may designate additional courses to be taken and grades to be received by students who fail to meet but come close to meeting the graduation requirements. Suspension may be held in abeyance until the conditions are or are not met.

Students readmitted on probation will be suspended if they do not attain a minimum grade-point average of 2.0 during their first semester (12 or more credit hours) or if they receive more than one grade of *F* during the period.

Once suspended, a student may not have that suspension rescinded by a grade change at a later date. The student may, however, apply for readmission noting the grade change. Students who have been suspended may not apply for readmission until one year after the suspension. To be considered for readmission, a student must have undertaken academic work at another institution, primarily in mathematics, science, or engineering, during the year of suspension and earned a grade-point average of at least 2.7.

Dean's Honors and Commendation Lists

The names of all students who, in a given semester, take 12 or more graded credit hours in course work that applies to graduation requirements (or in any additional SEAS courses taken) may appear on the Dean's Honor List if a grade-point average of 3.5 is achieved or on the Dean's Commendation List if a grade-point average of 3.0 is achieved. No disciplinary action may have been taken against the student, and no more than one grade below *B*− and no grades below *C*− may have been earned. A student who receives a grade of *I* (Incomplete) during a semester will not be placed on the Dean's Honors or Commendation List for that semester unless the *I* is removed no later than 30 days after the end of the marking period and the student continues to meet all the requirements for the Dean's Honors or Commendation List.

Incompletes

Conditions under which the grade of *I* (Incomplete) may be assigned are described under University Regulations. If a grade of *I* is not changed to a letter grade within 30 days, decisions on probation, removal from probation, and suspension will be made with the information on hand, in conformance with SEAS regulations.

Although the grade of *I* may remain on the records for a maximum of one year, the instructor should normally set a much briefer period within which the uncompleted work (usually the final examination or required paper) must be made up. The grade of *I* cannot be removed by the student's reregistering for the course here or taking its equivalent elsewhere. A grade of *I* that is not removed after one calendar year or at the time of graduation of the student, whichever occurs first, will be changed on the permanent record to a grade of *IF*. When the *I* is changed to a letter grade, the grade of *I* followed by the letter grade (e.g., *IB*) will appear on the student's record. The grade for which the *I* is changed will be applied to the grade report for the semester or summer session during which

the change is made for the purposes of determining probation, suspension, grade-point average, and Dean's and other honor lists.

Pass/No Pass Grading System

SEAS students may not take courses required for graduation on the pass/no pass (*P*/*NP*) grading system. They may, however, take courses outside their regular SEAS academic program under this grading system.

Students whose status of probation or suspension depends on a grade of *P* are given 30 days to have the grade changed. If not changed by the end of that period, the *P* will be considered a *C* for probation, suspension, Dean's List, and graduation purposes, and a grade of *NP* will be considered an *F*.

Residence

Thirty hours must be completed in residence. Full-time students normally complete their programs in four years. The core curriculum—the program of the first four semesters—provides the base of scientific principles and mathematical techniques necessary for the professional courses taken in the last four semesters.

Advisory System

Every entering undergraduate student is assigned a faculty advisor to assist in orientation in the professional discipline. Faculty advisors counsel students on their programs of study, achievement and maintenance of satisfactory scholastic performance, professional development, and extracurricular activity as part of the educational process. The advisor represents the student in all cases requiring faculty action.

Students must obtain their advisor's approval of their program of study prior to registration for each academic semester and summer session. The advisor's approval must be obtained before registering for a course at another institution. Until the work required for the degree is completed, students must consult with their advisors in all academic matters. However, an advisor may not deny entry into any course or activity to which the student is entitled under the regulations of the School.

Courses in the Humanities and Social Sciences /Bachelor of Science Programs

With the assistance of the advisor, each student prepares a program of elective courses in the humanities and social sciences. For most B.S. curricula, the program normally consists of a minimum of 18 credit hours, divided equally between the humanities and social sciences. Each 9-hour group must include two courses in one subject area and a third course in a different subject area. When a foreign language is taken as part of the humanities requirement, the following rules apply: (1) the foreign language studied must not be a native language of the student, unless the courses taken are literature courses; (2) if the student has studied the language previously, he or she must first take a placement test given by the language department concerned and enroll in a course recommended by that department; and (3) the student may use at most two foreign language courses to satisfy SEAS's humanities requirements. If two courses are used, they must be in the same foreign language. The advisor and the curriculum coordinator must approve the program.

Since the SEAS curricula are, by necessity, oriented toward technical subjects, the program in the humanities and social sciences should consist of courses that broaden the student's outlook. Courses in areas such as anthropology, economics, foreign languages, geography, history, literature, philosophy, political science, psychology, and sociology are considered appropriate.

Mission Statements and Educational Objectives

Department of Civil and Environmental Engineering

Mission Statement—The mission of the Department of Civil and Environmental engineering is to provide a broad-based, rigorous education in civil engineering, which leads to educating graduates who have a fundamental understanding of the underlying concepts of engineering analysis and design, and a sense of responsibility for professional service.

Educational Objectives—The civil engineering programs are designed to produce graduates who are well prepared to engage immediately in the practice of civil engineering and/or to continue their education in graduate studies in civil engineering or other professional studies such as law, medicine, and business. The undergraduate curriculum in civil engineering is designed to produce graduates who understand the basic principles of applied mathematics, basic sciences, and computing and have the ability to apply these principles in the analysis and solution of civil engineering problems; are trained to conduct, interpret, and evaluate the laboratory experiments used in the main branches of civil engineering; have the skill and knowledge to use modern engineering and computing tools in the solution of the challenging problems encountered in the civil engineering profession; possess a broad education in engineering as well as the humanities and social sciences to comprehend and envision the broader socioeconomic impacts and relevance of civil engineering projects; have the skills required for effective communication as a professional and for participation in the multidisciplinary efforts needed in many civil engineering projects; are fully aware of professional and ethical issues in the practice of civil engineering; and understand the need for lifelong learning and possess the necessary skills to pursue it.

Department of Computer Science

Mission Statement—The mission of the Department of Computer Science is to serve the global community by providing high-quality computer science education, research, and professional service and to advance computer technology in areas of selective excellence.

Educational Objectives—The objectives of the computer science program are to educate students to achieve proficiency in the following areas: software system design, software development, and project management; fundamentals of computer science (discrete structures, data structures, algorithms, and theory of computing); computer architecture, translators, networks, operating systems, and databases; and oral and written communication. An understanding of the overall social and professional context in which computing activities take place is emphasized.

Department of Electrical and Computer Engineering

Mission Statement—The mission of the Department of Electrical and Computer Engineering is to motivate and inspire our students by providing high-caliber, fully integrated programs in electrical, computer, and biomedical engineering in order to provide leadership in a rapidly evolving global information society in the service of humanity and to advance the state of knowledge in our disciplines by actively pursuing scholarly research for publication and dissemination.

Educational Objectives—The objectives of the programs are to educate students in the principles of engineering, including cognizance of their responsibilities as members of society. The engineering education is based on the sciences and the principles of design. Social responsibilities are instilled through a balanced program in the humanities and social sciences as well as coverage of specific topics in professional ethics and social responsibilities. The programs provide students with a solid foundation in electrical, computer, and biomedical engineering

through a balanced curriculum integrating the underlying scientific and mathematical knowledge with the latest technological developments. The curriculum is designed to produce engineers capable of functioning in the present technological environment and of adapting to future directions of the profession. Specifically, the programs aim to teach students how to analyze and implement complex interdisciplinary engineering projects; to give students a strong foundation for graduate studies in their field; to prepare students for competitive and challenging industrial applications; to teach students how to use state-of-the-art computer tools for solving engineering problems; to expose students to hands-on engineering experience through laboratory courses; to cultivate students' abilities to communicate and work effectively in teams; and to help students develop an understanding of the ethical issues and global perspectives arising in the practice of the engineering profession.

Department of Mechanical and Aerospace Engineering

Mission Statement—The mission of the Department of Mechanical and Aerospace Engineering is to educate students to become professional mechanical and aerospace engineers who are confident in their understanding of science and technology, who are creative in the face of new challenges, and whose analytical skill and thirst for lifelong learning will open new career horizons; to contribute to society through the conduct of relevant research at the forefront of mechanical and aerospace engineering knowledge and to provide opportunities for students to participate and learn through mentorship with the faculty; and to serve the nation, the community, and the university.

Educational Objectives—The undergraduate mechanical engineering program provides an integrated program of instruction in mechanical engineering in order to produce graduates who can practice engineering professionally and develop a successful career in engineering. Mechanical engineering is a broad field covering both design and analysis of complex systems that are useful to society. The well-educated mechanical engineer must have a thorough understanding of mechanics (solid and fluid), energy, and the response and control of mechanical systems designed to perform a useful function. To fulfill these requirements, our program is designed to give students a thorough grounding in mathematics and the basic sciences and to teach them to apply that knowledge in the design and analysis of engineering systems; to teach students to design engineering systems/devices and to analyze and solve engineering problems of complex scope; to prepare students for professional engineering practice and for graduate study; and to give students the understanding of the need for lifelong learning and the skills to pursue it. These objectives incorporate the development of effective oral and written communication skills, the use of software and other tools, and knowledge about the ethical, social, and economic impact of engineering practice on society.

Bachelor of Science Degree Programs

Check with the department concerned for total credit requirements for the degree programs that follow.

The listed curriculums on the following pages all assume electives to be at least 3 credit hours. Credit toward the degree is not allowed for exercise and sport activities courses. The key to abbreviations for course designations can be found at the beginning of the Courses of Instruction section.

Biomedical Engineering

Offered by the Department of Electrical and Computer Engineering, this innovative program provides a strong foundation in the basic sciences as well as the

theory and practice of biomedical engineering. Students choose an area of specialization from bioinformatics, biomechanics, instrumentation, telemedicine, or medical preparation. Distinguishing features of the program are its specialty laboratories, summer internships in metropolitan-area private or federal laboratories, and a capstone design seminar.

First Semester—UW 20; SEAS 1; ECE 1; BiSc 13; Chem 11; Math 31.
Second Semester—CSci 49; ECE 2; Chem 12; Math 32; Phys 21; elective.
Third Semester—CSci 103; ECE 11, 153; Math 33; Phys 22, 127.
Fourth Semester—ApSc 113; ECE 20, 117, 154, 159; Phys 128; elective.
Fifth Semester—ApSc 115; ECE 155; MAE 238; electives (7–10 credits).
Sixth Semester—ECE 121, 140, 156; electives (6–8 credits).
Seventh Semester—ECE 157, 184, 186; electives (9 credits).
Eighth Semester—ECE 158; Phil 135; electives (9–12 credits).

Electives must include three 3-credit social sciences courses and two 3-credit humanities courses. Remaining elective credit is chosen from lists of specified courses in the chosen area of specialization—bioinformatics, biomechanics, instrumentation, medical preparation, or telemedicine.

Civil Engineering

Civil engineering encompasses those branches of engineering most closely related to the control and improvement of our environment and of the physical conditions of life. Civil engineers apply many technical specialties in order to plan, design, and construct projects that range from buildings and transportation systems to space stations and space habitats.

First Semester—UW 20; SEAS 1; CE 1; Math 31; Chem 11; humanities or social sciences elective.
Second Semester—CSci 50; MAE 4; Math 32; Phys 21; humanities or social sciences elective.
Third Semester—ApSc 57, 113; Math 33; Phys 22; humanities or social sciences elective.
Fourth Semester—ApSc 58, 115, 130; CE 120; MAE 131; humanities or social sciences elective.
Fifth Semester—CE 117, 121, 166, 167; EES 1; MAE 126; humanities or social sciences elective.
Sixth Semester—CE 122, 188, 189, 192, 193, 194; humanities or social sciences elective.
Seventh Semester—CE 168, 185, 191, 195, 197; technical elective selected from list below.
Eighth Semester—CE 190, 196, 232; technical elective; design elective.

Technical Electives—ApSc 199; CE 198, 199, 205, 206, 207, 210, 211, 230, 231, 234, 242, 243, 244, 250, 251, 252, 253, 254, 257, 258, 272, 273, 290; EMSE 260; MAE 231, 234, 235, 236, 237.

Design Electives—CE 206, 207, 211, 241, 251, 252, 269.

The Department of Civil and Environmental Engineering also offers the Bachelor of Science major in civil engineering with an environmental engineering option, a transportation engineering option, and a medical preparation option. Additional information on the options can be found at www.cee.seas.gwu.edu.

Environmental Engineering Option in Civil Engineering—The environmental engineering option leads to a bachelor's degree in civil engineering. Students are prepared to work in technical environmental fields such as hazardous waste treatment, environmental impact assessment, and water resources engineering. Students are also prepared to pursue graduate study in environmental engineering.

Transportation Engineering Option in Civil Engineering—The transportation engineering option leads to a bachelor's degree in civil engineering. Transportation engineers design, construct, maintain, and upgrade transportation facilities, including highways, railroads, airfields, and ports. The program emphasizes automotive, highway, and multi-modal transportation safety and security.

Medical Preparation Option in Civil Engineering—The medical preparation option leads to a bachelor's degree in civil engineering and prepares the student for application to medical school. The student is also prepared to work in research and development or to pursue graduate study in the fields of biomechanics and biotechnology.

Computer Engineering

Computer engineering combines electronic design, computer architecture, programming of computing systems, computer networks, and applied mathematics. Students in the program are prepared in the theory and application of hardware and software design, computer networks, embedded systems, and very large scale integrated (VLSI) circuit design and applications. Students can take electives in advanced topics, such as optical networks, broadband wireless networks, and technologies for the next generation of information systems.

First Semester—UW 20; ECE 1; Chem 11; Math 31; SEAS 1; ECE 1; elective.
Second Semester—CSci 49, 123; ECE 2; Math 32; Phys 21; elective.
Third Semester—ApSc 113; CSci 103; ECE 11; Math 33; Phys 22.
Fourth Semester—ApSc 115; ECE 20, 117, 140; elective.
Fifth Semester—CSci 156; ECE 12, 122, 141, 162.
Sixth Semester—ECE 30, 144, 147, 156, 161, 181; elective.
Seventh Semester—ECE 126, 157, 182; two electives.
Eighth Semester—ECE 128, 158; Phil 135; two electives.

The eight electives must include three 3-credit courses in the social sciences, two 3-credit courses in the humanities, and three 3-credit technical courses. Technical electives may be chosen with the approval of the advisor from advanced undergraduate or graduate courses in engineering, computer science, mathematics, physical sciences, or biological sciences.

Computer Science

The program combines systems design, computer software development, networks, computer architecture, project design algorithms, and mathematics to provide a broad background in the disciplines that underlie computer science. Students are prepared to design and implement the software needed for Internet operations, graphic design and animation, and applications and for small, large, and embedded computing systems.

First Semester—UW 20; CSci 41, 53; Math 31; SEAS 1; humanities or social sciences elective.
Second Semester—CSci 123, 133; Math 32; science elective; humanities or social sciences elective.
Third Semester—CSci 135, 143; Math 33; science elective; humanities or social sciences elective.
Fourth Semester—ApSc 115; CSci 136, 147; science elective; humanities or social sciences elective.
Fifth Semester—CSci 150, 151, 156; math or science elective; humanities or social sciences elective.
Sixth Semester—CSci 160, 161, 178; humanities or social sciences elective; unrestricted elective.
Seventh Semester—CSci 169, 183, 195, non-computing elective; unrestricted elective.

Eighth Semester—CSci 184, 196, computer science elective; non-computing electives (6 hours); unrestricted elective.

Science electives must be chosen from BiSc 13–14, Chem 11–12, and Phys 21–22. Two of the three science electives must form a two-course sequence. Computer science electives may be selected from CSci 171, 173, 174, 177, 180, 181, 182, 184, 185, 186, 187, 188, 189, 190, 193, 194, and, with approval, graduate computer science courses.

The Department of Computer Science also offers the Bachelor of Science major in computer science with a bioinformatics option, a computer security and information assurance option, a digital media option, and a medical preparation option. Specific information on the options can be found at www.cs.gwu.edu/academics/.

Bioinformatics Option in Computer Science—This option is an interdisciplinary area at the intersection of biological, computer, and information sciences necessary to manage, process, and understand large amounts of data, such as that from the sequencing of the human genome or from large databases containing information about plants and animals for use in discovering and developing new drugs.

Computer Security and Information Assurance Option in Computer Science—This option encompasses network security, information warfare, cryptography, information policy, and computer forensics. It involves use of sophisticated software and hardware tools able to detect and prevent malicious intrusion or destruction of vital government and business computer systems and networks.

Digital Media Option in Computer Science—This option encompasses audio, video, the World Wide Web, and other technologies that can be used to create and distribute digital content. Digital media uses computers to create virtual worlds from which visuals can be generated and with which humans can interact.

Medical Preparation Option in Computer Science—This option is for students interested in pursuing a computer science major with preparation for admission to a school of medicine by combining additional natural science course work with computer science course requirements.

Electrical Engineering

Electrical engineers design the enabling technology for modern telecommunications networks, including the Internet, biomedical instrumentation, and electromagnetic applications. The program focuses on signal processing; communication theory and practice; voice, data, video and multimedia communication networks; very large scale integrated (VLSI) circuit design and applications; and control systems. Students can take electives in advanced topics, such as optical networks, broadband wireless networks, and technologies for the next generation of information systems.

First Semester—UW 20; Chem 11; Math 31; SEAS 1; ECE 1; elective.
Second Semester—CSci 49; ECE 2; Math 32; Phys 21; two electives.
Third Semester—ApSc 113; CSci 103; ECE 11; Math 33; Phys 22.
Fourth Semester—ApSc 114; ECE 20, 117, 140; elective.
Fifth Semester—ApSc 115; ECE 12, 122, 141, 162.
Sixth Semester—ECE 31, 121, 143, 144, 147, 156.
Seventh Semester—ECE 32, 126, 157, 172; elective.
Eighth Semester—ECE 158, 177; Phil 135; three electives.

The eight electives must include three 3-credit courses in the social sciences, two 3-credit courses in the humanities, and three 3-credit technical courses. Technical electives may be chosen with the approval of the advisor from advanced undergraduate or graduate courses in engineering, computer science, mathematics, physical sciences, or biological sciences.

Mechanical Engineering

Mechanical engineering encompasses a vast range of industrial activities. Mechanical engineers conceive, plan, design, and direct the manufacture, distribution, and operation of complex systems. Applications include aerospace, energy conversion, computer-aided design and manufacturing, power and propulsion systems, robotics, and control systems.

First Semester—UW 20; SEAS 1; MAE 1; Math 31; Chem 11; humanities or social sciences elective.

Second Semester—CSci 49 or 50, MAE 2, 4; Math 32; Phys 21; humanities or social sciences elective.

Third Semester—ApSc 57, 113; Math 33; Phys 22; humanities or social sciences elective.

Fourth Semester—ApSc 58, 130; ECE 11; MAE 117, 131.

Fifth Semester—CE 120; MAE 126, 166, 167, 190, 192.

Sixth Semester—ApSc 115; MAE 120, 134, 187, 191; humanities or social sciences elective.

Seventh Semester—MAE 149, 182, 193; technical electives (6 hours); humanities or social sciences elective.

Eighth Semester—MAE 152, 195, 196; technical electives selected from chosen area (6 hours); humanities or social sciences elective.

Technical Electives

Mechanical Systems Analysis and Design—ApSc 199; MAE 162, 163, 197, 198, 231, 232, 234, 235, 236, 237, 240, 241, 243, 247, 249, 251, 287.

Fluid Mechanics, Thermal Sciences, and Energy—ApSc 199; MAE 155, 162, 163, 198, 210, 220, 221, 226, 229, 259, 260, 262, 280, 282, 283.

The Department of Mechanical and Aerospace Engineering also offers the Bachelor of Science major in mechanical engineering with an aerospace engineering option, a biomechanical engineering option, and a medical preparation option. Additional information on the options can be found at http://mae.seas.gwu.edu.

Aerospace Option in Mechanical Engineering—The aerospace engineering option leads to a bachelor's degree in mechanical engineering while preparing the student to work in the aerospace industry or to pursue graduate study in aerospace engineering. It provides a strong foundation in aerodynamics, airplane performance, propulsion, aerospace structures, orbital mechanics, spacecraft dynamics, and aircraft and spacecraft design.

Biomechanical Engineering Option in Mechanical Engineering—The biomechanical engineering option leads to a bachelor's degree in mechanical engineering while preparing the student to work in the biomedical industry or to pursue graduate study in biomedical engineering. It provides a strong foundation in human anatomy and physiology, biomechanics, biomaterials, and design of biomedical devices.

Medical Preparation Option in Mechanical Engineering—The medical preparation option leads to a bachelor's degree in mechanical engineering and prepares the student for application to medical school. The student is also prepared to work in research and development or to pursue graduate study in the fields of biomechanics and biotechnology.

Systems Engineering

The multidisciplinary field of systems engineering applies engineering techniques and mathematical methods to improve planning and decision making in organizational systems composed of people, machines, and procedures. By observing, understanding, modeling, and predicting the behavior of such systems,

practitioners of systems engineering assist the decision-making process that seeks to design and operate the systems optimally. Systems engineering finds application in many areas, including communications, energy, environment, finance, health care, information technology, marketing, national defense, project management, software development, and transportation.

Each student must participate in an appropriate internship/co-op experience during the last two years of the program. This requirement may be satisfied by an approved full-time summer position after the second or third year or by one or two approved part-time positions requiring 15–20 hours per week during two of the final four semesters. A position obtained through the GW Co-op Office will usually be acceptable; the position may be either paid or unpaid.

The systems engineering program is designed to provide the student a broad and solid education in the basics of mathematical modeling, software and information systems, and the treatment of uncertainty. Analytical thinking is stressed in order to prepare the student for graduate education or productive professional employment. The program is planned to develop the student's communication skills and awareness of the current professional world.

First Semester—UW 20; CSci 41; EMSE 1; SEAS 1; Math 31; science elective.
Second Semester—CSci 53; Econ 11; Math 32; science elective; humanities or social sciences elective.
Third Semester—ApSc 113; CSci 133; EMSE 160; Math 33; science elective.
Fourth Semester—ApSc 115; Comm 40, 41, or 42; CSci 143; EMSE 109; humanities or social sciences elective.
Fifth Semester—ApSc 116; CSci 151; EMSE 101, 135; humanities or social sciences elective.
Sixth Semester—CSci 147; EMSE 102, 173, 182; technical elective; SEAS or statistics elective; humanities or social sciences elective.
Seventh Semester—EMSE 154, 171, 211; Mgt 120; Stat 183; technical elective.
Eighth Semester—EMSE 182, 191; Mgt 121; two technical electives.

Technical Electives

Each systems engineering major will gain specific expertise in a chosen technical area by taking a four-course sequence from another department or departments of the University. The four technical electives are selected with the approval of the student's academic advisor. Areas frequently chosen are computer science, economics, finance, management, mathematics, naval science, statistics, and specific fields of engineering.

The Department of Engineering Management and Systems Engineering also offers the Bachelor of Science major in systems engineering with a medical preparation option. Additional information can be found at www.emse.gwu.edu.

Medical Preparation Option in Systems Engineering—The medical preparation option leads to a bachelor's degree in systems engineering and quantitatively prepares students for medical careers through a program that emphasizes decision modeling. Decision modeling is increasingly applicable to the medical field because of the growing use of computers and information systems in medicine and the interplay of diagnosis, treatment, and economics.

Bachelor of Arts Degree Programs

The School of Engineering and Applied Science offers a Bachelor of Arts degree, with majors in applied science and technology and in computer science. Each program provides a strong and level base for students who intend to make their careers in fields allied to science and technology or to computer science.

Applied Science and Technology

The Bachelor of Arts major in applied science and technology is a broad-based engineering-oriented program, with a breadth of liberal arts, for students who

intend to make their careers in fields allied to science and technology and/or continue their education toward professional careers in law, medicine, business, teaching, or the media. It is designed to help students pursue their goals in a world that relies more and more upon science and technology.

First Semester—UW 20, CSci 41, EMSE 1, SEAS 1, Chem 11, Math 20.
Second Semester—CSci 10, Chem 12, Math 21, humanities or social sciences elective, arts elective.
Third Semester—CSci 49 or 53, Math 32, Phys 1, literature elective, unrestricted elective.
Fourth Semester—ApSc 115, EMSE 160, Phys 2, literature elective, unrestricted elective.
Fifth Semester—BiSc 13, EMSE 101, Comm 40 or 41 or 42, MAE 4, allied minor elective.
Sixth Semester—BiSc 14, ECE 11, two allied minor electives, humanities or social sciences elective.
Seventh Semester—MAE 192, ECE 184, EMSE 135, allied minor elective, humanities or social sciences elective.
Eighth Semester—CE 190, allied minor elective, humanities or social sciences elective, three unrestricted electives.

Electives—Electives in literature and arts are chosen from specified lists of courses available from the advisor. Allied minor electives are selected, with the approval of the advisor, to form a coherent and meaningful program of 15 credit hours. Popular selections include biology, business, communication, computer science, design, economics, engineering, environmental studies, finance, international business, management, mathematics, media, medical preparation, psychology, statistics, and operations research.

Computer Science

The Bachelor of Arts major in computer science provides a broad-based liberal arts curriculum for students who wish to augment technical knowledge with business, communication, and management skills. Foundation courses focus on mathematics, science, programming methodology and skills, computer organization and design, and implementation of algorithms. Additional breadth or depth is afforded by a selection of computer science electives.

The program is designed for students with interests in two or more disciplines. Accordingly, students in this major must complete a minimum of 24 credits of 100-level courses in another academic department. Additional course requirements include UW 20; Math 20–21 or 30, 31; CSci 41, 53, 123, 133, 135, 143, 147, 178; four electives chosen from designated CSci courses; general curriculum requirement courses, chosen from specified lists available from the advisor, in social or behavioral science, natural science, statistics, humanities, literature, language and culture, and creative and performing arts. Students are expected to undertake a significant independent project by completing CSci 195 and 196 or a course in another field that includes a thesis or significant project.

The minimum number of credits required for the major in computer science is 120; the credit total depends on whether the student chooses to complete a second major or to complete an option within the computer science major. Options include bioinformatics, digital media, and medical preparation. Additional information about the Bachelor of Arts major in computer science as well as each of the options is available at www.cs.gwu.edu/academics/.

Special Programs

Five-Year Programs

Five-year dual degree programs available to SEAS students include the B.A. or B.S. in computer science with an M.S. in computer science as well as the B.S.

in systems engineering with one of the following four master's programs: M.S. in systems engineering, M.S. in engineering management, M.E.M., M.A. in economics. Specific information is available from the departments concerned. In addition, a five-year program leading to a B.A. in physics from Columbian College of Arts and Sciences and a B.S. in any SEAS undergraduate major is available; consult the SEAS Office of the Dean or the Department of Physics.

Integrated Engineering and Law Program

In addition to the combined bachelor's/master's programs that may be completed in five years, the University offers the integrated engineering and law program. The program provides an opportunity for very highly qualified high school students to follow an education path composed of a B.S. or B.A. degree in a SEAS field and then a J.D. degree, by assuring admission to the Law School's J.D. program for students who meet stated conditions. Detailed information on this program is available from the Office of Admissions.

Integrated Engineering and Medicine Program

The University offers an eight-year, integrated engineering and medicine program that provides an opportunity for very highly qualified high school students to earn a B.S. or B.A. degree in a SEAS field and then an M.D. degree, by assuring admission to the School of Medicine and Health Sciences M.D. program for students who meet stated conditions. Detailed information is available from the Office of Admissions.

Honors Research Program

To provide individualized research experience to academically gifted students, the School has established an Honors Research Program. A student who maintains a grade-point average of 3.3 or above or is admitted to the School with a combined SAT score of 1250 and a rank in the upper 10 percent of his or her high school class is eligible for this program. Participants attend an honors research seminar and each works individually with a faculty member, performing a research project of mutual interest. Students participating in the program earn 3 credits per semester; a minimum of 9 credits is needed to complete the program. Upon written request by the student, 6 of these credits may be used as technical electives. Qualified students interested in applying for the program should contact the honors research chairman of the department in which the research is to be conducted.

Minors and Secondary Fields of Study

School of Engineering and Applied Science students with majors other than systems engineering may graduate with a minor in operations research in addition to their major. Four courses are required for the minor: EMSE 101, 102, 154 or 173, and a fourth course selected from EMSE 135, 154, 171, 173, 182. Depending on the student's major, additional credit hours beyond the minimum required for the major may be necessary in order to complete the minor in operations research; students should consult their advisors before embarking upon the minor requirements.

SEAS students in majors other than computer science may complete a minor in computer science with four approved computer science courses that are not required in their major program.

The School offers secondary fields of study in computer engineering, computer science, electrical engineering, engineering analysis, and operations research to students in other schools of the University. SEAS students are cautioned to consult their advisor and department chair before enrolling in a secondary field of study in another school of the University.

Double Majors

A student who completes the requirements for two majors in SEAS may graduate with a double major, provided the two majors are in different departments. The student should consult advisors in the two departments and declare both majors on the appropriate form in the SEAS Student Records Office.

A SEAS student may also pursue a second major in Columbian College of Arts and Sciences, and a CCAS student may pursue a second major in SEAS, provided that permission has been obtained from the appropriate administrative office of each of the two schools.

A SEAS B.A. student may pursue a second major in the Elliott School of International Affairs, and an Elliott School student may pursue a second major in SEAS, provided that the SEAS major leads to a B.A. and permission has been obtained from the appropriate administrative office of each of the two schools.

In all cases, degrees are earned from the home school, and students must complete the major in their own school in order to graduate.

3:2 Dual-Degree Programs Combining Liberal Arts and Engineering

The School of Engineering and Applied Science has developed 3:2 dual-degree programs in liberal arts and engineering with the following accredited institutions: Bowie State University, Gallaudet University, University of Richmond, Hood College, Bridgewater College, St. Thomas Aquinus College, and Trinity College of Washington, D.C.

Students initially enroll in the 3:2 dual-degree program at one of the above institutions and pursue a three-year course of studies covering social sciences, humanities, mathematics, physics, and chemistry, which helps the student develop broad cultural perspectives, analytic abilities, and communication skills. Students then follow a two-year program at the School of Engineering and Applied Science. During this phase of study, students may specialize in any of the areas of engineering or computer science offered in the School's regular four-year programs. Upon successful completion of the two-year program at George Washington University, students are awarded two baccalaureate degrees: a B.S. or B.A. from the first institution and a B.S. in engineering or computer science from GW. For further information on the 3:2 dual-degree programs, contact the admissions offices of the institutions listed above.

In addition, SEAS participates in a 2:2 program with Richmond College in London, England.

ELLIOTT SCHOOL OF INTERNATIONAL AFFAIRS

Dean H. Harding
Associate Deans H.L. Agnew, K. Lord, E.A. McCord

The Elliott School of International Affairs offers graduate and undergraduate programs to prepare individuals for understanding and working in an increasingly globalized world. The historical roots of the Elliott School extend back to the establishment of the School of Comparative Jurisprudence and Diplomacy in 1898. In 1966, the School separated from the School of Government, Business, and International Affairs to become an independent unit, the School of Public and International Affairs. In 1987, the name was changed to the School of International Affairs, and in 1988 the School was renamed in honor of Evelyn E. and Lloyd H. Elliott. Lloyd Elliott was the President of The George Washington University from 1965 to 1988.

The Degree of Bachelor of Arts

The Elliott School offers programs leading to the degree of Bachelor of Arts with majors in international affairs, Asian studies, Latin American and hemispheric studies, and Middle Eastern studies. These programs provide a broad liberal arts education and depth in historical and contemporary issues in international affairs. The programs are interdisciplinary and multidisciplinary, combining courses offered through the School with courses offered by other schools and departments of the University.

General Requirements for the Degree

Academic Work Load

The normal academic work load for a full-time student is 15 credit hours. A full-time student not on probation may take a course load of up to 17 credit hours. A student with a strong academic record may take up to 18 credit hours with the approval of the dean (additional tuition charges apply). Students on probation are limited to 13 hours. Students doing internships or working are advised to reduce their course load.

Scholarship Requirements

In order to graduate, a student must have the following: (1) 120 credit hours of passing grades (courses in exercise and sport activities cannot be included in the required hours); and (2) a cumulative grade-point average of at least 2.0.

Dean's Honor List

The name of every student who attains a 3.5 grade-point average in course work is placed on the Dean's Honor List for that semester. Appearance on the list is limited to full-time students registered for a minimum of 12 credit hours in a given semester and to part-time students registered for a minimum of 12 credit hours over a period of two consecutive semesters, which may include a summer term.

Academic Standing

A student whose cumulative grade-point average is less than 2.0 but at least 1.0 any time after having attempted a minimum of 24 credit hours is placed on probation: "first probation" for the initial semester, "second probation" if continued on probation for a second semester. For part-time students and those

enrolled in summer sessions, a semester is interpreted to mean a time interval in which at least 12 credit hours have been attempted. A student on probation is limited to no more than 13 credit hours of course work per semester.

A student who resumes a cumulative grade-point average of 2.0 or more after a first or second semester on probation is removed from probationary status. Failure to resume a cumulative grade-point average of 2.0 after two successive semesters on probation results in suspension. The Dean's Council may continue a student on probation if satisfactory progress is demonstrated during the probation period.

A student whose cumulative grade-point average falls below 1.0 any time after having enrolled in a minimum of 24 credit hours as a student in the Elliott School will be suspended.

Students who are suspended for poor scholarship may apply for readmission after the lapse of one fall or spring semester. To be considered for readmission, the student must submit evidence to the Dean's Council of conduct during absence from the University which indicates that the student will profit from readmission. A student suspended twice for poor scholarship will not be readmitted.

Semester Warning—A student whose cumulative grade-point average is less than 2.0 after attempting a minimum of 12 credit hours is placed on semester warning at the end of the semester and is strongly advised to take corrective measures (e.g., limitation of course load to no more than 13 credit hours).

Incompletes

Conditions under which the grade of *I* (Incomplete) may be assigned are described under University Regulations. Incomplete course work must be completed no later than one calendar year from the last day of the examination period of the semester or summer session in which the grade of *I* was assigned. When work for the course is complete, the grade earned will be indicated in the form of *I*, followed by the final grade. The indication of *I* cannot be removed from the transcript. A grade of *I* that is not changed within this period automatically becomes an *IF*. The grade of *I* cannot be changed by reregistering for the course at GW or by taking its equivalent elsewhere. In cases of well-documented extenuating circumstances, an instructor and a student may jointly petition the Dean's Council for additional time in which to complete the work of the course. Such petitions should be submitted within a year of the assignment of the grade of *I*.

Residence

Students must complete at least 60 of their final 90 hours in residence to earn a degree in the School. Students approved for study abroad during their junior or senior year may request an exception through the Office of Academic Advising and Student Services. Note that in all cases a total of 60 credit hours in residence is required for Latin or special honors. Except in special circumstances, at least 9 of the final 15 hours must be completed in residence.

Internships

Internships offer students the opportunity to make practical use of the knowledge they acquire in the classroom. Undergraduates who have completed at least 30 credit hours and have a cumulative grade-point average of at least 2.5 are eligible to arrange internships for credit (to a total maximum of 6 credits toward the degree). Academic work in the field of the internship is required. A zero-credit internship is also available.

Internships are available in the private and public sectors. Students are responsible for locating their own internships; listings are posted in the GW Career Center.

Double Majors

A student who completes the requirements of two majors in the Elliott School (for example, international affairs and Asian studies) may graduate with a double major. Such a student should consult with an Elliott School advisor and officially declare both majors on the appropriate form available in the Student Services office.

Students may combine a major field in the Elliott School with a second major field offered by the Columbian College of Arts and Sciences or the School of Engineering and Applied Science, as long as the other major is toward a B.A. (majors in Communication and in the School of Media and Public Affairs are excluded). Permission for the second major must be obtained from the appropriate administrative office of the other school.

Students in the Columbian College of Arts and Sciences, whether pursuing a B.A. or a B.S. major, may also take a second major in the Elliott School. Students in the School of Engineering and Applied Science pursuing a B.A. may take a second major in the Elliott School. Students wishing to pursue these options must request approval through the Elliott School Student Services office. Students must complete all of their degree requirements for their major in their home school in order to graduate with a second major from the other school.

Regulations on Study Abroad

Students are encouraged to travel and study abroad. Those wishing to study abroad must consult their academic advisor and the University's Office for Study Abroad. A maximum of 45 credits may be transferred in from study abroad. GW courses taken abroad for GW credit do not apply to this maximum (i.e., specific courses taken through GW Study Centers and GW Summer Abroad for which students receive GW credit as opposed to transfer credit). Students must secure the dean's prior approval for any plan of study abroad if the credit earned is intended to apply to the degree program in which they are registered. Students must apply to a program from the University's List of Study Abroad Programs. A catalogue or other description of the study abroad program must be presented for consideration together with detailed descriptions of the courses to be taken. See Study Abroad Programs.

Pass/No Pass Option

A student in the Elliott School of International Affairs who has a cumulative grade-point average of 2.5 or better may, with the approval of an advisor and the dean, take one course per semester and receive a grade of *P*, Pass, or *NP*, No Pass, which will be recorded on the student's transcript but will not be reflected in the cumulative grade average. A student must sign up for such an option at the Student Services office within the first three weeks of classes. Under no circumstances may a student change from pass/no pass status to graded status, or vice versa, after the end of the third week of the semester. Required courses in the student's major (except those in which the grade of *P* or *NP* is normally assigned) may not be taken on a pass/no pass basis. A transfer student may not elect to take a course on a pass/no pass basis until the second semester of enrollment in the University. No more than six courses in which the grade of *P* or *NP* is assigned will apply toward the degree, including courses in which the grade of *P* or *NP* is normally given.

General Curriculum Requirements

General curriculum requirements for all Elliott School students are listed below. Requirements for the specific majors in international affairs, Latin Amer-

ican and hemispheric studies, Middle Eastern studies, and Asian studies are outlined under the appropriate heading in Courses of Instruction. For information on earning credit by examination or waiving curriculum requirements, students should see their academic advisor in the Elliott School.

All students take (1) 4 credits of UW 20; (2) 6 credits of math and/or science courses; (3) 9 credits of humanities or 6 credits of humanities and 3 credits of creative arts courses; (4) 16 credits of social science courses, including Econ 11–12, IAff 5, PSc 1, and one course chosen from Anth 2 or 4, Geog 1 or 2 or 120, or PSc 2; (5) 15 credits of courses relating to societies and cultures: two courses chosen from Hist 38, 40, 72 and a 3-credit course from three of the following regions: Africa, Asia, Americas, Europe/Eurasia, Middle East; (6) second-year level of proficiency in one foreign language should be attained by the end of the sophomore or junior year (see major field for additional language requirements). All Elliott School majors require third-year–level proficiency in a modern foreign language.

Students must consult the program guidelines available from the Elliott School Office of Academic Advising and Student Services before they choose courses to fulfill these requirements.

Secondary Fields of Study

Students can take a secondary field of study, such as business, economics, or languages, in other schools of the University. Students from other schools of the University can take a secondary field of study in international affairs in the Elliott School of International Affairs. See an academic advisor in the Elliott School.

SCHOOL OF PUBLIC HEALTH AND HEALTH SERVICES

Dean R.J. Katz
Associate Deans J.J. Reum, K.L. Hunting, J.G. Palen, R.T. Parkin

The School of Public Health and Health Services was established within The George Washington University in 1997. SPHHS originally encompassed three departments—Public Health, which had been part of the School of Medicine and Health Sciences; Health Services Management and Policy, which had been part of the School of Business; and Exercise Science, which had been part of the Graduate School of Education and Human Development. Now, seven departments form SPHHS: Environmental and Occupational Health, Epidemiology and Biostatistics, Exercise Science, Global Health, Health Policy, Health Services Management and Leadership, and Prevention and Community Health.

Degree programs offered by SPHHS include the Bachelor of Science with majors in athletic training, exercise science, and public health; the Master of Public Health; the Master of Health Services Administration; the Master of Science in the fields of exercise science, health policy, and public health microbiology and emerging infectious diseases; and the Doctor of Public Health. SPHHS cooperates with several other schools within GW in offering joint and dual degree programs. Secondary fields for undergraduates in schools other than SPHHS and graduate certificate programs are offered as well.

The School of Public Health and Health Services includes the Hirsh Health Law and Policy Program, Wertlieb Educational Institute for Long-Term Care Management, Center for Global Health, Center for Health Services Research and Policy, Center for Risk Science and Public Health, Prevention Research Center, and Institute for Mental Health Initiatives.

SPHHS Regulations

SPHHS regulations governing the following subjects are analogous to those of Columbian College of Arts and Sciences: residence; academic work load; academic standing (including probation, suspension, semester warning, and mid-semester warning); dean's lists; incompletes; pass/no pass option; earning an additional hour of credit; placement, waiver, and credit examinations; and second bachelor's degrees. See the section headed Columbian College of Arts and Sciences.

Bachelor of Science Degree Programs

Athletic Training

The Bachelor of Science with a major in athletic training is accredited by the Commission on Accreditation of Allied Health Education Programs. Graduates are prepared to take the National Athletic Training Association Board of Certification Examination.

The program prepares students for a range of careers in an allied health care profession responsible for the health care of athletes and physically active individuals. Athletic trainers provide information on injury prevention, evaluate and treat athletic injuries, rehabilitate injuries, and provide other aspects of athletic health care.

Students may apply to enter the athletic training major upon completion of 30 credit hours with a minimum grade-point average of 2.25. Contact the Exercise Science Department for specific entrance requirements and an application.

The degree program requires 124 credit hours, with 42 to 44 credits of general curriculum courses: Engl 9 and 10 or 11 or the University Writing requirements; BiSc 3–4 or 13–14; Math 51; Psyc 1; PubH 101; Stat 53; a course chosen

from SpHr 11 or Comm 41, 42, 43; two courses chosen from Engl 51–52, 61–62, 71–72; three courses chosen with approval of the advisor from the Departments of American Studies, Anthropology, Economics, Geography, History, Philosophy, Psychology, and Sociology.

Required courses in the athletic training major are 80 to 82 credit hours: ExSc 50, 102, 109, 125, 126, 134, 137, 141, 145 or 146, 151, 152, 154–55, 158, 159, 160, 161 (12 credits), 168, 169, 171; 2 credits of ExSA courses; and 5 to 7 elective credits.

Exercise Science

The Bachelor of Science with a major in exercise science prepares students for careers in health promotion, corporate fitness and wellness programs, exercise physiology, personal training, exercise rehabilitation, and coaching, as well as graduate study in exercise science, sport psychology, physical therapy, medicine, and other clinical health professions.

The 124-credit-hour program requires the general curriculum courses listed directly above with the athletic training major, an exercise science core, courses in the concentration, and electives as necessary to complete the degree program.

The 44-credit exercise science core consists of ExSc 50, 103, 109, 134, 140, 151, 152, 154–55, 158, 171, 175; and 2 credits of ExSA courses.

Students in the exercise science program select either the health and fitness concentration or the pre-health professional concentration, typically by the sophomore year.

Health and Fitness Concentration—27 credit hours: ExSc 107, 121, 123, 138; PubH 103; a designated offering of ExSc 101; and three courses chosen from ExSc 120, 125, 136, 145, 146, or designated offerings of ExSc 101.

Pre-Health Professional Concentration—28 credit hours chosen in accordance with the intended professional field. For those preparing to apply to a physical therapy program: ExSc 159, 168, 169; Phys 1–2; Chem 11–12. For those preparing to apply to nursing, physician assistant, or M.D. programs: ExSc 159; Phys 1–2; Chem 11–12, 151–52, 153–54.

Public Health

The Bachelor of Science with a major in public health aims to increase understanding of public health principles for students who intend graduate study toward careers in law, medicine or another health profession, or public health. The program is also available to students who plan to pursue entry-level jobs in sectors of public health or health services. With a liberal arts base, the program emphasizes technical detail and analytic skills, nurturing critical thinking and synthesis of information in recognizing historical and societal associations of trends in public health and health care delivery.

Students may apply to enter the 120-credit-hour public health major upon completion of 60 credits with a minimum grade-point average of 3.0. General curriculum requirements listed under Columbian College of Arts and Sciences must be completed, with the exception that a statistics course must be included in fulfillment of the quantitative and logical reasoning category. Required courses in the major are PubH 101, 102, 103, 105, 121, 132, 172, 180, 191, 195, and 6 credits of SPHHS electives chosen from specified courses with approval of the advisor. The remainder of the program may be a secondary field, a minor, or approved electives.

Secondary Fields of Study

Secondary fields of study in public health and in exercise science are available to undergraduates in other schools of the University. See the entries for Exercise

Science and for Public Health in the course listings section for courses that pertain to these secondary fields. SPHHS students may choose a secondary field from Columbian College of Arts and Sciences, the Elliott School of International Affairs, or the Schools of Business, Engineering and Applied Science, or Medicine and Health Sciences.

SCHOOL OF MEDICINE AND HEALTH SCIENCES

Bachelor of Science in Health Sciences Degree Programs

The School of Medicine and Health Sciences offers programs to prepare health sciences professionals in selected disciplines, emphasizing the interdependent roles of the network of professionals who constitute the health care team.

In addition to the Bachelor of Science in Health Sciences degree programs listed below, certificate programs are offered in several areas—some in conjunction with degree programs, others freestanding. All undergraduate health sciences programs are designed for upper-division transfer students who have completed a minimum of 60 credit hours of course work at an accredited postsecondary institution.

The Bachelor of Science in Health Sciences may be earned via distance education with majors in clinical management and leadership and in clinical research administration. The didactic course work for the clinical laboratory science major and the concentration in emergency medical services management within the emergency health services major are also provided via distance education. Students must have specified hardware and software and meet the technical requirements outlined on the Distance Learning Programs website learn.gwumc.edu/hscidist/DE/techreq.htm.

For specific information on the content and requirements of the undergraduate degree programs described briefly below, contact the Office of Admissions, Health Sciences Programs, School of Medicine and Health Sciences, George Washington University, Washington, D.C. 20037.

Clinical Laboratory Science

Clinical laboratory scientists perform and evaluate various laboratory procedures to determine the absence, presence, extent, and basis of disease. As medical investigators, program graduates perform complex examinations on state-of-the-art instruments and computers in the areas of hematology, chemistry, microbiology, immunology, and blood banking.

Students applying to the 120-credit-hour clinical laboratory science program must have satisfactorily completed 65 credits in specified general curriculum courses, complete a telephone interview, and submit letters of recommendation and an Essential Functions Acknowledgement Form. In addition to the 65 credits of general curriculum courses, students must complete 55 credits in the major, including the 15-credit health sciences core and 41 credits of specified pathology courses.

Emergency Health Services

Emergency health services personnel may plan and organize programs, supervise emergency department clinicians, assist in projects that require expertise in emergency medical procedures, and function in the network of information systems that is central to emergency care.

All applicants to the emergency health services major must hold certification as an Emergency Medical Technician. Where applicable, the following records should be provided: proof of current participation in an emergency medical services system and photocopies of scores or certificates from national registry examinations or certifying board examinations. Before the first day of classes, students admitted to the emergency paramedicine concentration must submit documentation from a physician attesting to their ability to satisfy the Functional Job Requirements of a Paramedic and must provide proof of immunizations as required by the program prior to the first day of class. The program requires 126

credit hours, including 60 prerequisite credits in specified general curriculum requirements, the 15-credit health sciences core, and 51 credits specific to a selected concentration either in emergency paramedicine or EMS management.

Clinical Management and Leadership

The major in clinical management and leadership has been developed for health care professionals prepared at the associate's degree level (e.g., radiographers, respiratory therapists, nurses, medical laboratory technicians) to broaden knowledge and experience in the management and leadership of health sciences services and develop pathways for career advancement.

Applicants must submit documentation of an associate's degree or equivalent preparation in a health sciences discipline and current professional certification or other appropriate health science credential. The 123-credit-hour degree program includes 30 credits of general education courses, 15 credits in health sciences core courses, and 18 credits of health sciences courses specific to the major.

Clinical Research Administration

Clinical research administration is a large and expanding field that involves the processes in which products (drugs, devices, biologicals) and treatment protocols are developed for patient care. This major prepares health sciences professionals to participate in the science and business of developing these patient care products and protocols.

Applicants must submit documentation of completion of at least 60 credit hours of college-level course work and current professional certification or other appropriate health sciences credentials. The 124-credit-hour degree program includes 30 credits of general education courses, 15 credits in health sciences core courses, and 19 credits of health sciences courses specific to the major.

Sonography

Using ultrasound technology, diagnostic medical sonographers scan patients to obtain images that help physicians diagnose disease. Students in the bachelor's degree program develop competencies in at least four subspecialties of ultrasound imaging.

Students applying to the 128-credit-hour sonography program must have satisfactorily completed 60 credits in specified general curriculum requirements, of which up to 48 credits may be from completion of an approved program in diagnostic radiology, nuclear medicine technology, radiation therapy technology, or diagnostic medical sonography, provided students hold or will hold current registration during the first semester of study at The George Washington University. In addition to the 15-credit health sciences core, students must complete 53 credits of specified sonography courses.

See Health Sciences in the course listings section for courses that pertain to a secondary field in that subject, offered by the School of Medicine and Health Sciences. A secondary field in emergency health services is offered as well.

The Doctor of Medicine Early Selection Program

The School of Medicine and Health Sciences offers an early selection program intended to give talented and committed students early assurance of admission to the M.D. program. Students of exceptional promise are chosen for the early selection program at the end of their sophomore year and are expected to mod-

ify their planned curriculum for the junior and senior years toward more creative and difficult course choices. Early assurance of admission is planned to provide students the freedom to pursue a rigorous liberal education, while completing minimal premedical requirements without concern for the grade-point average. Specific details about the early selection program are available through the Office of Admissions of the School of Medicine and Health Sciences.

Courses

COURSES OF INSTRUCTION

The following section provides listings and descriptions of undergraduate courses offered by the departments of instruction and interdepartmental programs. Degree requirements of departments and programs in Columbian College of Arts and Sciences and the Elliott School of International Affairs appear under the department or program heading; degree requirements of the School of Engineering and Applied Science, the School of Business, and the School of Public Health and Health Services appear under the respective school's section.

The number of credit hours given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the title of the course. Thus, a year course giving 3 credit hours each semester is marked (3–3), and a semester course giving 3 credit hours is marked (3). A credit hour may be defined as one 50-minute period of class work or one laboratory period a week for one semester.

Following most course descriptions is a parenthetical statement listing the semester (fall or spring) for which the course is scheduled. The term *academic year* is used only with two-semester courses and indicates that the first half of the course is to be offered in the fall semester and the second half in the spring semester. Not all offerings for the summer sessions are listed in this Bulletin. Students should consult the Summer Sessions Announcement for additional summer offerings. Schedules of Classes are published for the fall and spring semesters and are available online.

The courses as listed here are subject to change. The University reserves the right to withdraw any course announced or to change the course fees shown.

Key to Abbreviations

The following abbreviations are used for course designations. (The list excludes designations for courses limited to students in the School of Medicine and Health Sciences.)

Accy	Accountancy
AmSt	American Studies
Anat	Anatomy
Anth	Anthropology
ApSc	Applied Science
Arab	Arabic
AH	Art History
ArTh	Art Therapy
Astr	Astronomy
Bioc	Biochemistry
BiSc	Biological Sciences
BmSc	Biomedical Sciences
Bios	Biostatistics
BAdm	Business Administration
Chem	Chemistry
Chin	Chinese
CE	Civil Engineering
Clas	Classical Studies
CCAS	Columbian College of Arts and Sciences
Comm	Communication
CSci	Computer Science
Cnsl	Counseling
EES	Earth and Environmental Sciences
Econ	Economics
Educ	Educational Leadership
ECE	Electrical and Computer Engineering
EMda	Electronic Media
EHS	Emergency Health Services
EMSE	Engineering Management and Systems Engineering
Engl	English
EFL	English as a Foreign Language
EnRP	Environmental and Resource Policy
Epid	Epidemiology
EMBA	Executive Master of Business Administration
ExSA	Exercise and Sport Activities
ExSc	Exercise Science
Film	Film Studies
Fina	Finance
FA	Fine Arts
ForS	Forensic Sciences
Fren	French
Gnet	Genetics
Geog	Geography
Ger	German Language and Literature
Grek	Greek

HSci	Health Sciences
HSML	Health Services Management and Leadership
Hebr	Hebrew
Hist	History
HomP	Hominid Paleobiology
Honr	Honors
HDev	Human Development
HRD	Human Resource Development
HmSc	Human Sciences
HmSr	Human Services
Hmn	Humanities
Immu	Immunology
IAff	International Affairs
IBus	International Business
Ital	Italian
Japn	Japanese
Jour	Journalism
Kor	Korean
PSLD	Landscape Design
Latn	Latin
Law	Law
Ling	Linguistics
Mgt	Management Science
Mktg	Marketing
MBAd	Master of Business Administration
Math	Mathematics
MAE	Mechanical and Aerospace Engineering
Micr	Microbiology
Onco	Molecular and Cellular Oncology
MStd	Museum Studies
Mus	Music
NSc	Naval Science
NeuS	Neuroscience
OrSc	Organizational Sciences
Path	Pathology
PStd	Peace Studies
Phar	Pharmacology
Phil	Philosophy
Phys	Physics
Phyl	Physiology
PCm	Political Communication
PMgt	Political Management
PPsy	Political Psychology
PSc	Political Science
Port	Portuguese
PsyD	Professional Psychology
Psyc	Psychology
PAd	Public Administration
PubH	Public Health
PPol	Public Policy
Rel	Religion
Rom	Romance Literatures
SEAS	School of Engineering and Applied Science
SMPA	School of Media and Public Affairs
SLP	Service–Learning Program
Slav	Slavic Languages and Literatures
Soc	Sociology
Span	Spanish
SpEd	Special Education
SpHr	Speech and Hearing
Stat	Statistics
SMPP	Strategic Management and Public Policy
TrEd	Teacher Education
TrDa	Theatre and Dance
TStd	Tourism Studies
Univ	University
UW	University Writing
Viet	Vietnamese
WLP	Women's Leadership Programs
WStu	Women's Studies
Ydsh	Yiddish

Explanation of Course Numbers

Courses numbered 1–100 are planned for students in the freshman and sophomore years. With the approval of the advisor and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisites to advanced courses, but they may not be taken for graduate credit.

Courses numbered 101–200 are planned for students in the junior and senior years. Except for accountancy courses, they may be taken for graduate credit only upon the approval of the dean and the instructor at the time of registration. Such approval is granted only with the provision that students must complete additional work to receive graduate credit. Accountancy courses numbered 101–200 may not be taken for graduate credit.

Courses numbered 201–300 are planned primarily for graduate students. They are open, with the approval of the instructor, to qualified seniors; they are not open to other undergraduates. Qualified seniors in the School of Business registering for these courses must have a 3.0 average, the prior approval of the department chairman who is responsible for the graduate course, and the prior

approval of the dean. Nondegree students who have not completed a bachelor's degree may not enroll in graduate courses offered by the School of Business.

Courses numbered 301–400 in Columbian College of Arts and Sciences and the School of Engineering and Applied Science are limited to graduate students, but they are primarily for doctoral candidates. Courses numbered 301–400 in the School of Business are primarily for doctoral students; the courses are open to selected master's students upon approved petition. In the Graduate School of Education and Human Development courses numbered 301–400 are limited to graduate students with master's degrees from accredited institutions.

Courses numbered 701, 721, and 751 represent an ongoing program of curriculum innovation at GW. Courses numbered in the 770s and 780s are taught by scholars who hold appointments as University Professors. The 700 numbers do not indicate the level of difficulty.

A few courses are numbered in the 400s and 800s to set them apart for administrative reasons; these courses are often analogous to courses numbered in the 200s.

ACCOUNTANCY

Professors C.M. Paik, D.R. Sheldon, W.R. Baber, K.R. Kumar, S.H. Kang
Associate Professors L.G. Singleton, K.E. Smith (*Chair*), L.C. Moersen, F. Lindahl
Assistant Professors C.L. Jones, R.L. Tarpley, L. Liang, S. Hansen, M. Sullivan

See the School of Business for the program of study leading to the degree of Bachelor of Accountancy.

51 **Introductory Financial Accounting** (3) Kumar
Basic knowledge of financial accounting concepts and standards as an essential part of the decision-making process for the management of private investment and for business and government organizations. Same as BAdm 51. Prerequisite: sophomore standing. (Fall and spring)

52 **Introductory Managerial Accounting** (3) Staff
Basic knowledge of managerial accounting concepts, procedures, analyses, and internal reports as an essential part of the decision-making process for public and private-sector organizations. Same as BAdm 52. Prerequisite: Accy/BAdm 51. (Fall and spring)

110 **Financial Statement Analysis** (3) Kumar
Introduction to the analysis and interpretation of corporate financial statements within the context of a company's industry and economic environment. Cash flow analysis, profitability and risk analysis, accounting policy analysis, forecasting and performance analysis, elements of equity valuation, and decision perspectives of creditors. Prerequisite: Accy/BAdm 52. (Fall and spring)

121 **Intermediate Accounting I** (3) Singleton
Accounting principles underlying the preparation of financial statements and their application in the measurement and reporting of selected balance sheet items and related revenue and expense recognition; accounting for receivables, inventories, fixed assets, intangible assets, and liabilities. Prerequisite: Accy/BAdm 51. (Fall)

122 **Intermediate Accounting II** (3) Singleton
Accounting for stockholders' equity, earnings per share, debt and equity investments, income taxes, pensions and other postretirement benefits, leases, accounting changes, statement of cash flows, financial statement analysis and disclosure. Prerequisite: Accy/BAdm 51. (Spring)

151 **Business Law: Contracts, Torts, and Property** (3) Moersen
Essential legal principles of contracts, torts, and property, including trusts and estates, leases, professional liability, and the Uniform Commercial Code. Same as SMPP 105. Prerequisite: Accy/BAdm 51. (Fall)

152 **Business Law: Enterprise Organization** (3) Moersen
The legal aspects of organizing, financing, and operating an enterprise: agency, partnerships, corporations, securities regulation, insurance, secured credit financing, and commercial paper. Same as SMPP 106. Prerequisite: Accy/BAdm 51. (Spring)

153 **Business Law: Regulatory Environment of Business** (3) Kane
General overview of the legal system, role of law, and business regulation. Specific business applications include administrative law, antitrust, employer and consumer obligations, securities regulation, international law. Same as SMPP 104. (Fall and spring)

161 **Federal Income Taxation** (3) Smith
A study of federal income tax concepts, including what shall be taxed, and when, and at what rate. Taxable entities, income measurement, the use of different tax rates for different types of income, and the use of the tax laws to motivate taxpayer behavior to achieve economic goals. Prerequisite: Accy/BAdm 51. (Fall)

171 **Auditing** (3) Staff
A study of generally accepted auditing standards, accepted professional auditing practices and procedures, and governmental auditing standards, including reviewing and evaluating financial controls, auditing financial statements, and testing financial data of manual and computer based accounting systems. Prerequisite: Accy 122. (Fall)

181 **Accounting Systems** (3) Staff
Introduction to the design and operation of accounting systems and data-management controls. Principles and applications of internal control applicable to manual and automated accounting systems. Prerequisite: Accy 122. (Fall)

190 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. Prerequisite: department approval.

192 **Advanced Financial and Tax Accounting** (3) Smith
Accounting for partnerships and corporations. Formation, operation, and liquidation of each type of entity, including corporate combinations. Both financial and tax accounting for each type of transaction. Prerequisite: Accy 121, 161. (Spring)

193 **Advanced Managerial Accounting** (3) Baber
Techniques and practices that foster an informed use of financial information for planning, resource allocation, performance evaluation, and control purposes. Integration of concepts from other disciplines, especially economics, quantitative methods, behavioral science, and business policy and strategy. Primarily taught using case method. Prerequisite: Accy/BAdm 52. (Spring)

196 **Financial Accounting Capstone** (3) Kumar
Synthesis and application of knowledge of financial accounting to specific contexts, using the perspectives of the preparer and user of financial statements. Prerequisite: senior status. (Spring)

199 **Independent Study** (3) Staff
Assigned topics. Admission by permission of the department chair. (Fall and spring)

AFRICANA STUDIES

Committee on Africana Studies
J.A. Miller (*Director*), A. Alexander, N. Blyden, A. Brooks, Y. Captain, J. Hampton, J. Horton, J. James, M. Jones, K. Lornell, D. Moshenberg, P. Palmer, J. Vlach, G. Wald, A. Zimmerman

Minor in Africana studies—Offered through Columbian College of Arts and Sciences, the interdisciplinary minor consists of 21 credit hours, including a four-course core of Anth 178, AmSt/Hist 173, Hmn 7, and either Hist 116 or Anth 181, plus three additional courses selected either from African or African American courses, as listed below. Special topics or 700 courses that pertain may be selected with approval of the advisor.

AmSt/Hist 173 *African American History*
AmSt 174 *Special Topics in African American History*
Anth 170 *Cultures of the Caribbean*
Anth 178 *Cultures of Africa*
Anth 181 *African Roots from* Australopithecus *to Zimbabwe*

Engl 73–74 *Literature of Black America*
Engl 169 *Ethnicity and Place in American Literature*
Engl 174 *African American Literature*
Geog 164 *Geography of Africa*
Hist 116 *History of Africa*
Hist 184 *Civil War and Reconstruction*
Hmn 7 *African Humanities*
IAff 93 *Africa: Problems and Prospects*
Phil 125 *Philosophy of Race and Gender*
PSc 182 *African International Politics*
PSc 186 *U.S. Policies Toward Sub-Saharan Africa*
Soc 179 *Race and Minority Relations*

AMERICAN STUDIES

Professors B.M. Mergen, J.O. Horton, J.M. Vlach, R.W. Longstreth, J.A. Miller, P.M. Palmer (*Chair*), M. Knight
Associate Professors T.A. Murphy, M. McAlister
Assistant Professor C. Heap
Adjunct Associate Professors E. Mayo, P.J. Cressey
Associate Professorial Lecturers R.D. Wagner, O. Ridout, F. Goodyear

Bachelor of Arts with a major in American studies—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—AmSt 71–72 or Hist 71–72 or equivalent.
3. Required courses in related areas—Two semesters of foreign language or placement into a Level Three foreign language by examination; also, one course about a foreign culture selected from the CCAS list of foreign cultures or approved by the Department.
4. Requirements for the major—two 100-level U.S. history courses (one with a significant focus on the pre-20th century, the other primarily focused on the 20th century); AmSt 168, 179–180, and five courses in the student's concentration. Areas of concentration are a) diversity and difference; b) the built environment and urban and regional spaces; and c) cultural analysis. A list of appropriate courses for each concentration is maintained by the department. At least two of the five courses in the area of concentration must be cross-listed in American studies.

In all cases of AmSt courses that are cross-listed with other University departments, students may register for the course in either department. With approval, other pertinent upper-level courses may be used to fulfill group requirements, including Topics courses on appropriate subjects.

Five-Year Bachelor of Arts with a major in American studies and Master of Arts in the field of American studies—Students interested in the dual degree program should consult the department before the beginning of the junior year.

Special Honors—For Special Honors in American studies, a major must meet the special honors requirements stated under University Regulations, be recommended by the faculty, and receive a grade of *A* on the senior paper, which is written as part of AmSt 180.

Minor in American studies—Required: 18 credit hours of 100-level courses, including AmSt 167 or 168, and two 100-level U.S. history courses, one of which is focused primarily on pre-20th century and the other primarily on 20th-century material.

50 **Washington, D.C.: History, Culture, and Politics** (3) Staff
Introduction to interdisciplinary methods of studying the contemporary city. Major problems of metropolitan life, past and present, analyzed by faculty and community leaders. Emphasis on experiential team projects. Same as Hist 50. (Fall)

71–72 **Introduction to American Studies** (3–3) Murphy, Palmer, McAlister
Themes and issues in American civilization since Colonial times, with emphasis on their contemporary importance. (Academic year)

130 **Sexuality in U.S. History** (3) Heap
Examination of the changing social organization and meaning of sexual practices and desires in American culture, with particular attention to the relationship between sexuality and gendered racial and class identities and politics. Same as Hist/WStu 130.

139–40 **Women in the United States** (3–3) Harrison, Murphy
Survey of women's experience in U.S. history, the way gender has organized relations of power, and the impact of race, region, class, and ethnicity on women and on gender roles. Same as Hist/WStu 139–40. (Academic year)

144 **Explorations in Historical Geography** (3) Staff
Examination of selected themes in the cultural geography of the United States over the course of its history, in relation to an overview of the historical geography of the country. Same as Geog 144. (Spring)

145 **Folk Arts in America** (3) Vlach
Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts. Same as AH 145.

160 **Material Culture in America** (3) Vlach
Review and analysis of the cultural messages embedded in our material surroundings. Consideration of a range of humanly created artifacts, ranging from specific objects to vast landscapes. Same as Anth 130.

165 **Introduction to Folklore** (3) Vlach
Survey of the forms of folk expression, including verbal art, music, dance, and material culture. Examination of the materials and methods of folklore research. Same as Anth 192.

167 **Themes in U.S. Cultural History** (3) McAlister
An examination of the special ideas, values, and modes of expression that have made American life distinctive, as revealed through a variety of sources, including fiction, popular media, photography and the arts, and material culture. May be repeated for credit provided the topic differs. Same as Hist 167.

168 **Cultural Criticism in America** (3) McAlister, Heap
A variety of approaches to cultural criticism, encompassing the nature of aesthetic accomplishment as well as the social contexts that alter and enrich the shape of cultural expression. The significance of culture to politics, social life, and the development of individual and collective identities. Limited to majors. (Fall and spring)

171–72 **U.S. Social History** (3–3) Horton, Stott
AmSt 171: Daily life, institutions, intellectual and artistic achievements of the agrarian era, 1607–1861. AmSt 172: The urban–industrial era from 1861 to present. Same as Hist 171–72. (Academic year)

173 **African American History** (3) Alexander
Same as Hist 173.

174 **Special Topics in African American History** (3) Horton
Concentration on specific issues central to the African American experience. Consult the *Schedule of Classes* for issues to be addressed.

175–76 **American Architecture** (3–3) Longstreth
Stylistic properties, form and type characteristics, technological developments, and urbanistic patterns are introduced as a means of interpretation of historic meaning. Buildings are analyzed both as artifacts and as signifiers of social, cultural, and economic tendencies. AmSt 175: 1600–1860; AmSt 176: 1860–present. Same as AH 176 and 191. (Academic year)

179 **Practicum in American Studies** (3) Staff
For American studies majors in their senior year. Supervised assignments in public or private agencies engaged in the investigation, interpretation, or conservation of the social, material, and expressive elements that constitute American culture. Biweekly seminar on campus. (Fall)

180 **Proseminar in American Studies** (3) Staff
For American studies majors in their senior year. Directed research and writing in preparation for public symposium at the end of the academic year. (Spring)

181 **U.S. Media and Cultural History** (3) McAlister
History and analysis of 20th-century U.S. media and culture, including the rise of consumer culture, film, and television. Racial, gendered, and national identities in the context of modernism, mass culture, and globalization. Same as Hist 181.

185 **Black Women in U.S. History** (3) Alexander
Same as Hist/WStu 185.

186 **U.S. Urban History** (3) Stott, Heap
History of American urban life and culture from the colonial era to the present, focusing on transitions from pre-industrial to industrial and post-industrial

forms. The social and spatial configuration of U.S. cities, and the urban politics of race, class, and gender. Same as Hist 186. (Fall)

187 **Building Cities** (3) Staff
Same as Geog 187.

192 **The American Cinema** (3) Staff
History and criticism of American films. The course will enable the student to recognize and evaluate cinema techniques, to express the evaluation clearly in writing, and to understand the role of films in the context of American culture. Same as AH 192. (Spring)

193 **Archaeology Field/Laboratory Research** (3) Brooks
Same as Anth 113.

194 **Historical Archaeology** (3) Staff
Same as Anth 187.

195 **Independent Study** (1 to 3) Staff
Open to a limited number of American studies majors as directed research or as an internship with a Washington museum or historical society. Approval of advisor required. (Fall and spring)

198 **Special Topics** (3) Staff
May be repeated for credit provided the topic differs. Admission by permission of instructor.

ANTHROPOLOGY

Professors A.S. Brooks (*Chair*), C.J. Allen, J.M. Vlach, D. Gow, B. Wood, J.C. Kuipers, B.D. Miller, D. Bell, R.R. Grinker, W.J. Frawley, P.W. Lucas
Associate Professor E.H. Cline
Assistant Professors S.C. Lubkemann, B.G. Richmond
Instructor R.M. Bernstein
Adjunct Associate Professor P.J. Cressey
Professorial Lecturers D.H. Ubelaker, R. Potts, G. Teleki, R. Shepherd
Associate Professorial Lecturers J. Love, R. Albro
Assistant Professorial Lecturers S. Johnston

Bachelor of Arts with a major in anthropology—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Anth 1, 2, 3, and 4.
3. Required courses in other areas—(a) two-year proficiency in French, German, Russian, or Spanish (or another language approved by the Anthropology Department); (b) 6–12 credit hours of course work in related departments approved by the advisor. Recommended for sociocultural emphasis are courses in economics, history, political science, psychology, religion, and sociology; for archaeological emphasis, courses in American studies, art history, geography, geology, and history; for emphasis in biological anthropology, courses in anatomy and biological sciences; for emphasis in linguistic anthropology, courses in linguistics and in speech and hearing. Courses in statistics are strongly recommended for all anthropology majors.
4. Requirements for the major—In addition to the four prerequisite courses, 24–36 credit hours in anthropology courses, including Anth 198 and at least one course from each of the following five categories: aspects of culture (courses numbered in the 150s as well as 117, 121, 130, 191, 192, and 193); linguistics (courses numbered in the 160s); ethnology (courses numbered in the 170s); biological anthropology (courses numbered in the 140s); and archaeology (courses numbered in the 180s and 113, 114, 116). Qualified seniors may enroll in 200-level seminar courses with the permission of the instructor. See the Graduate Programs Bulletin. Up to 6 credit hours of ethnographic or archaeological field school credit may be accepted and applied toward the major, if approved by the department, and majors are encouraged to participate in such programs. Opportunities are available for field and laboratory research, both within the department and as internships in the Washington area. Credit for such work (not to exceed one-quarter of the student's total second-group credit hours in anthropology) may be granted through registration in Anth 195.

Bachelor of Arts with a major in archaeology—An interdepartmental major offered by the Anthropology Department in cooperation with the Fine Arts and Art History Depart-

ment and the Classical and Semitic Languages and Literatures Department. The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Anth 3.
3. Required courses in other areas—12 hours or equivalent in French, Spanish, Italian, German, Arabic, Hebrew, Latin, or Greek. Since graduate study in archaeology usually involves broader preparation and requires knowledge of at least one classical and one modern language, students intending to pursue graduate study should consult with the departmental advisor as early as possible in their undergraduate programs.
4. Requirements for the major—(a) Anth 118; (b) 3 hours of field and laboratory work chosen from Anth 113, 114, 116, 195, 284, 286; (c) 12 hours of anthropological archaeology courses chosen from the Anth 180s; (d) 15 hours, including at least one course chosen from each of the following four groups: (1) AH 101, 102, 147; (2) Clas 71, 72, 107, 108; (3) Hist 107, 108, 109, 110; (4) AH 111, 112, 155, Anth 188/AH 193 (the last course may be applied only once toward the major); (e) 3 additional hours selected from the courses listed above or, with approval of the advisor, a related course in anthropology, art history, classics, or history.

Bachelor of Science with a major in biological anthropology—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Anth 1, 2, 3, and 4; BiSc 13–14.
3. Required courses—12 credit hours in biological anthropology and Paleolithic archaeology (Anth 114, 141–149, 181, 183); 8 credit hours of approved 100-level BiSc courses; a minimum of 3 credit hours in a related natural or physical science or mathematics; 6 credit hours of sociocultural or linguistic anthropology (all other Anth courses except those in the 180s). The major in biological anthropology may not be pursued in conjunction with the major in anthropology.

Five-Year Bachelor of Arts with a major in anthropology or Bachelor of Science with a major in biological anthropology and Master of Arts in the field of anthropology—Students interested in the dual degree program should consult the department before the beginning of the junior year.

Special Honors—For Special Honors in anthropology, archaeology, or biological anthropology, a major must meet the special honors requirements stated under University Regulations, register for 3 credit hours of Anth 195, Undergraduate Research, and write a paper of special distinction arising out of a program of directed reading or research. Students must confer with an advisor before beginning the work.

Minor in general anthropology—21 credit hours are required, including Anth 1, 2, 3, 4, and three additional courses in anthropology, which must be taken in different subdisciplines. For the purposes of this minor, the department's courses may be divided into subdisciplines as follows: biological anthropology—courses in the 140s; archaeology—courses in the 180s and 113; anthropological linguistics—courses numbered in the 160s; sociocultural anthropology—all other 100-level courses, with the exception of Anth 195 and 196, in which the topic is variable.

Minor in archaeology—18 credit hours are required, including Anth 3, 118, and four courses chosen from Anth 113, 114, 116, 180–189, 286. An independent study course in archaeology or an approved art history course may be substituted for one of the four courses.

Minor in biological anthropology—16–19 credit hours are required, including Anth 1 and 9 credits chosen from Anth 141–149; an approved field or research course or an approved course or course sequence in a related field (including biological sciences, geology, psychology, statistics, and certain other disciplines).

Minor in sociocultural anthropology—18 credit hours are required, including Anth 2; one course in ethnography (Anth 170–179); four courses in aspects of culture or methods and theory (Anth 117, 121, 130, 150–159, 191, 192, 193, 198).

Minor in cross-cultural communication—18 credit hours are required, including Anth 2 or 4, 161, 162; Anth 150 or 159; one course in ethnography (Anth 170–179); one course chosen from Anth 153, 154, 155, 158, 163, 168, 169, 192, or 193.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

1 **Biological Anthropology** (4) Richmond and Staff
Survey of human evolution, genetics and physical variation, and primatology. Regular laboratory exercises. Laboratory fee, $40. (Fall and spring)

2 **Sociocultural Anthropology** (3) Grinker, Miller, and Staff
Survey of the world's cultures, illustrating the principles of cultural behavior. (Fall and spring)

3 **Archaeology** (3) Cline and Staff
Introduction to archaeological survey and excavation techniques and laboratory methods of dating and analysis. Brief history of archaeology and survey of world prehistory. Films and laboratory exercises. (Fall and spring)

4 **Language in Culture and Society** (3) Kuipers
Comparison and analysis of how cultures use language to communicate. The relationship of language to issues of human nature, gender, race, class, artistic expression, and power. Laboratory fee, $20. (Spring)

113 **Archaeology Field/Laboratory Research** (3) Brooks, Cressey
Field and/or laboratory techniques and interpretation. Topics may include excavation methods, recording photography, preservation, stratigraphy and environmental reconstruction, typology, ceramic analysis, use–wear analysis, and spatial analysis. Specific research area and topics announced in the *Summer Sessions Announcement*. Same as AmSt 193. (Summer)

114 **Paleoanthropological Field Program** (3 or 6) Brooks
Intensive course on field research in paleoanthropology, including excavation methods, identification and analysis of materials, paleoecology, archaeology, and human anatomy. Conducted at selected sites in Eurasia, Africa, or Australia. Visits to comparative sites and collections in the region. (Summer)

116 **Mediterranean Field Program** (3) Cline
Participation in archaeological field school. (Summer)

117 **Methods in Sociocultural Anthropology** (3) Grinker, Kuipers
Approaches to field research. Conceptual bases and biases in the delineation of problems and in the selection, analysis, and organization of data. Students will design and carry out their own field projects in the Washington area. Prerequisite: Anth 2. (Spring)

118 **Method and Theory in Archaeology** (3) Staff
Required seminar for archaeology majors on data collection, analysis, and interpretation. Prerequisite: Anth 3. (Spring)

121 **The Anthropology of Gender: Cross-Cultural Perspectives** (3) Bell and Staff
Same as WStu 121.

130 **Material Culture in America** (3) Vlach
Same as AmSt 160.

141 **Functional Anatomy** (3) Richmond
The anatomy of the human body, how it works, and how it differs from other animals, especially other primates. Principles and approaches of functional morphology and biomechanics and how function can be reconstructed from fossils, with special focus on the musculoskeletal system. No prior knowledge of anatomy is required. Laboratory fee, $50. Prerequisite: Anth 1. (Fall)

142 **Human Evolutionary Anatomy** (3) Wood and Staff
The structure and function of human anatomy, as compared to our closest relatives, the great apes. Using this comparative approach, the course investigates the fossil record of human evolution, with an emphasis on reconstructing relationships, function, behavior, and adaptation in fossil hominids. Prerequisite: Anth 1. (Spring)

145 **Forensic Anthropology Laboratory** (2) Ubelaker
Identification of human skeletal remains by body part, age, sex, race, and individual disease or trauma history; study of skeletal variation in modern and recent populations. Taught at the Smithsonian. Corequisite: Anth 146. (Spring)

146 **Human Variation** (1) Ubelaker
An overview of human variation, with special emphasis on the skeleton. Includes history of physical anthropology, individual and population variations, archaeological recovery of human remains, paleodemography, growth, paleopathology, and forensic anthropology. Same as Anat 252. Prerequisite: Anth 1; corequisite for undergraduates: Anth 145. (Spring)

147 **Hominid Evolution** (3) Wood
The fossil record of hominid evolution considered in the light of evolutionary theory. Brief review of the earlier human antecedents, with concentration on the Pleistocene remains. Laboratory fee, $40. Prerequisite: Anth 1. (Fall)

148 **Primatology** (3) Staff
Physical and behavioral characteristics of the various primate groups and their relationship to human physical and cultural evolution. Prerequisite: Anth 1. (Fall)

149 **Topics in Biological Anthropology** (3) Wood and Staff
Topic announced in the *Schedule of Classes*. Instructors will be drawn from GW faculty and Smithsonian Institution staff. May be repeated for credit if topic varies.

150 **Human Rights and Ethics** (3) Lubkemann and Staff
Issues of basic human rights and their violation by different cultures, states, and organizations. Genocide, ecocide, abuses on the basis of ethnicity, religion, or similar factors, and the treatment of those seeking asylum. Rights of informants and groups studied in anthropological research. Prerequisite: Anth 2. (Spring)

151 **Development Anthropology** (3) Lubkemann
The impact of the world economy on nonindustrial societies. Analysis of the role of anthropology in international development programs aimed at alleviating problems in the Third World. Prerequisite: Anth 2. (Fall)

152 **Cultural Ecology** (3) Staff
Basic principles of cultural ecology. Human interaction with the ecosystem both past and present; emphasis on the application of anthropological precepts to current environmental problems.

153 **Psychological Anthropology** (3) Grinker
The cross-cultural study of the relationship between culture and personality. Topics include emotion, conceptions of the self, mental health and illness, sexuality, marriage and parenting, and cognition. Psychobiological, cultural, ecological, and psychoanalytical theories are examined. Prerequisite: Anth 2 or permission of instructor. (Spring, alternate years)

154 **Illness, Healing, and Culture** (3) Miller
Introduction to medical anthropology. What the record of human evolution and prehistory tells about human health; the epidemiology of health and illness; how different cultures define disease; understanding illness and healing systems cross-culturally; the political economy of illness; and the role of medical anthropology in health care and international development.

155 **Religion, Myth, and Magic** (3) Allen and Staff
Theories of religion developed by anthropologists; survey of world religions with emphasis on non-Western societies; religious processes and change. Same as Rel 155.

156 **Politics, Ethnicity, and Nationalism** (3) Grinker
Comparative analysis of political systems; political processes, such as factionalism, styles of leadership, political ritual. Prerequisite: Anth 2 or permission of instructor. (Fall, alternate years)

157 **Kinship, Family, and Community** (3) Bell, Grinker
Cross-cultural analysis of how people form, maintain, and transform social groups and boundaries. Focus on how communities such as family, ethnic group, and nation are defined in moral terms.

158 **Art and Culture** (3) Allen
The role of art in culture, with emphasis on small-scale societies; influences upon the artist, and beliefs and practices associated with art production. Prerequisite: Anth 2 or permission of instructor.

159 **Symbolic Anthropology** (3) Allen
The study of culture through the analysis of symbolic systems including myth, cosmology, folklore, art, ritual, political symbolism, and the symbolic study of kinship. Prerequisite: Anth 2 or permission of instructor.

161 **Language, Culture, and Cognition** (3) Kuipers
The role of language and culture in the organization of human experience. Beginning with debates about linguistic relativity, the course explores the way language use shapes cognition and practice in a variety of cultures and social contexts. Prerequisite: Anth 4. Laboratory fee, $20. (Fall, alternate years)

162 **Ethnographic Analysis of Speech** (3) Kuipers
Linguistic variation and change in discourse practices; social and political correlates of linguistic interaction; recording, transcription, and analysis of verbal interaction. Prerequisite: Anth 4. Laboratory fee, $40. (Fall, alternate years)

163 **Psycholinguistics** (3) Frawley
Same as Ling 102.

168 **Language and Linguistic Analysis** (3) Staff
Same as Ling 101. (Spring)

169 **Special Topics in Linguistic Anthropology** (3) Kuipers and Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

170 **Cultures of the Caribbean** (3) Staff
Culture history and ways of life among the area's various cultural groups up to the ethnographic present. Prerequisite: Anth 2 or permission of instructor.

171 **North American Native Peoples** (3) Staff
Comparative study of Indian groups representative of the different culture areas of the United States and Canada. Contemporary issues involving indigenous groups, the wider society, and the state. Prerequisite: Anth 2 or permission of instructor. (Fall, alternate years)

172 **Cultures of Central and South America** (3) Allen and Staff
Culture history and ways of life in a selected region of Central or South America. Regional focus to be announced in the *Schedule of Classes*. Prerequisite: Anth 2 or permission of instructor. (Fall, alternate years)

173 **Cultures of the Pacific** (3) Love
Culture history and ways of life among native peoples of Melanesia, Micronesia, and Polynesia. Prerequisite: Anth 2 or permission of instructor.

174 **Cultures of Southeast Asia** (3) Kuipers
Introduction to the history, art, ecology, and politics of Southeast Asia. Comparison and interpretation of recent ethnographic case studies, archaeological evidence, and current political events in order to understand the diversity of Southeast Asian traditions. (Spring, alternate years)

175 **Asian Ethnography** (3) Staff
Intensive study of the culture and history of selected peoples of East, Central, or South Asia. Specific area to be announced in the *Schedule of Classes*. May be repeated for credit. Prerequisite: Anth 2 or permission of instructor.

177 **Cultures of the Near East** (3) Staff
Geographic environment, language, religion, and social structure of settled and nomadic peoples of the Near East: emphasis on the Arab world. Prerequisite: Anth 2. (Fall)

178 **Cultures of Africa** (3) Grinker, Lubkemann
Comparative examination of the history, cultural development, and contemporary problems of sub-Saharan African cultures. New World African cultures are also considered. Prerequisite: Anth 2 or permission of instructor.

179 **Japanese Culture Through Film** (3) Hamano
Same as Japn 162. (Spring)

180 **Ethnohistory** (3) Staff
Reconstruction of the history of a selected preliterate society through the analysis of historical documents, oral traditions, archaeological remains, and other indirect sources. Specific topic to be announced in the *Schedule of Classes*.

181 **African Roots from *Australopithecus* to Zimbabwe** (3) Brooks
The development and contributions of Africa from human beginnings through medieval states. Topics include human evolution, origins of art, technology, trade, and animal/plant domestication, rise of African states, early relations with Europe and Asia, antecedents of contemporary African diversity. Prerequisite: Engl 11 or 13. (Spring)

182 **Archaeology of North America** (3) Staff
History of American archaeology; survey of North American culture history from human entry into the Americas during the Pleistocene period until the time of the first European contacts. Focus on peoples north of Mexico. Prerequisite: Anth 3.

183 **Human Cultural Beginnings** (3) Brooks
Survey of prehistory in Europe, Africa, and Asia from the earliest hominid cultures to the beginnings of agriculture. Prerequisite: Anth 3. (Fall)

184 **Rise of Old World States** (3) Cline
Survey of prehistory in the Near East, Egypt, Europe, and other areas, from the beginnings of agriculture to the rise of Babylon. Prerequisite: Anth 3. (Spring)

185 **Archaeology of Middle and South America** (3) Staff
Culture history of pre-Columbian Middle and South America from the Paleo-Indian period through the Spanish Conquest; in-depth study of a particular region. Prerequisite: Anth 3.

186 **The Origins of Civilization** (3) Staff
Emergence of urbanism and the state in the prehistory of different world regions. Prerequisite: Anth 3.

187 **Historical Archaeology** (3) Cressey
Survey of the basic data and methods of research in the material culture of recent history. Same as AmSt 194.

188 **Archaeology of Israel and Neighboring Lands** (3) Cline
The archaeology of Israel and adjacent areas (Syria, Jordan, Lebanon). Examination of many major sites and monuments. Significant problems and current debates. Same as AH 193. (Fall)

189 **Special Topics in Archaeology** (3) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

190 **Cultures and Diasporas in the Americas** (3) Staff
Voluntarily and forcibly displaced and resettled peoples in the Americas, including the earliest settlers, slaves, immigrants, refugees, migrant workers, illegal aliens, tourists, and others are studied in local, transnational, and global contexts. Culture change and ethnic identity formation among resettled groups; repatriation. Prerequisite: Anth 2 or permission of instructor.

191 **Anthropology in Performance** (3) Garner, Allen
Exploration of the relationships among social interaction, ritual, and dramatic performance. Improvisation workshops and discussion based on readings about non-Western cultures. Same as TrDa 140.

192 **Introduction to Folklore** (3) Vlach
Survey of the forms of folk expression, including verbal art, music, dance, and material culture, and the interaction between folk forms and popular culture. Examination of the materials and methods of folklore research. Same as AmSt 165.

193 **Ethnographic Film** (3) Kuipers and Staff
Still and motion-picture photography as an integral aspect of anthropological research. A study of recent and historic ethnographic films and an introduction to the forms and methods of making visual ethnographic records. Prerequisite: Anth 2 or permission of instructor. Material fee, $20.

195 **Undergraduate Research** (arr.) Staff
Individual research problems to be arranged with a member of the faculty. May be repeated for credit. Prerequisite: Appropriate introductory course or permission of instructor.

196 **Special Topics** (3) Staff
Courses offered by visiting faculty; experimental offerings. Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

198 **Foundations of Anthropology** (3) Allen, Grinker, Lubkemann
The development of anthropological thought as seen in historical context. Exploration of selected basic concepts and theories of contemporary anthropology. To be taken in the junior or senior year. Prerequisite: Anth 2. (Spring)

APPLIED SCIENCE

Interdepartmental course offerings in the School of Engineering and Applied Science.

57 **Analytical Mechanics I** (2) Haque and Staff
First half of a one-year sequence. Concepts of statics: force systems, conditions of force and moment equilibrium, simple structures, distributed forces, centroids, internal forces, friction, moments of inertia. Prerequisite or concurrent registration: ApSc 113, Phys 21. (Fall and spring)

58 **Analytical Mechanics II** (3) Haque, Chichka
Second half of a one-year sequence. Concepts of dynamics: kinematics of particles, velocity and acceleration, translating and rotating reference frames, particle dynamics, motion under central and electromagnetic force, effect of Earth's rotation, vibrations, work, kinetic and potential energy, dynamics of systems of particles. Prerequisite: ApSc 57. (Fall and spring)

113 **Engineering Analysis I** (3) Haque, Mavriplis
Analytical methods for the solution of problems in engineering, the physical sciences, and applied mathematics: applications of ordinary differential equations, matrices and determinants, eigenvalues and eigenvectors, systems of ordinary linear differential equations, Bessel and Legendre functions. Prerequisite or concurrent registration: Math 33. (Fall and spring)

114 **Engineering Analysis II** (3) Kahn and Staff
Analytical methods for the solution of problems in engineering, the physical sciences, and applied mathematics: complex variables, Fourier series and integral, frequency filters, Laplace transforms, inversion and Duhamel integrals; partial differential equations. Prerequisite: Math 33. (Fall and spring)

115 **Engineering Analysis III** (3) van Dorp and Staff
Analytical methods for the solution of engineering problems using concepts from probability and statistics: probability modeling, random variables and their distributions, mathematical expectation, sampling, point and confidence interval estimation, hypothesis testing, correlation, regression, and engineering applications. Prerequisite: Math 32; Engl 9 or 10. (Fall, spring, and summer)

116 **Engineering Analysis IV** (3) Soland and Staff
Analytical methods using advanced concepts from probability and statistics: multivariate distributions, expectation, generating functions, parametric families of distributions, sampling and sufficient statistics, estimation, hypothesis testing, and engineering applications. Prerequisite: ApSc 115, Math 33. May be taken for graduate credit. (Fall)

130 **Materials Science** (3) Gilmore
Structure of perfect and imperfect solids, thermodynamics of solids, reaction rate theory, electrons in solids, electron transport, electrical properties of junctions, magnetic materials, optical properties of materials. Prerequisite: Chem 11, Math 33, Phys 22. (Fall and spring)

199 **Honors Research Project and Seminar** (3) Staff
Student designs and carries out a research project under the supervision of a faculty advisor. Students from all engineering disciplines meet periodically to present projects and discuss results. Enrollment limited to students admitted to the Honors Research Program. May be repeated for credit.

ARABIC

See **Classical and Semitic Languages and Literatures.**

ARCHAEOLOGY

See **Anthropology.**

ART

See **Fine Arts and Art History.**

ASIAN STUDIES

Program Committee: S. McHale (*Director*), B. Dickson, S. Hamano, J. Kuipers, K. Larsen, E. McCord

The Elliott School of International Affairs offers a multidisciplinary program leading to a Bachelor of Arts with a major in Asian studies.

Bachelor of Arts with a major in Asian studies—The following requirements must be fulfilled.

1. The general curriculum requirements stated under the Elliott School of International Affairs.

2. Required courses for the major—Econ 169 or 170; three courses selected from Hist 101, 118, 187, 188, 189, 190, or 196; IAff 91; two courses selected from PSc 170, 173, 175, 190, or 192; one course in Asian literature; and three 100-level Asia-related courses, selected in consultation with the program director.
3. Completion of third-year–level language study in an approved Asian language (through Chin 11, Japn 8, or Kor 8).

Special Honors—In addition to the general requirements stated under University Regulations, a candidate for Special Honors in Asian studies must have attained a 3.4 grade-point average overall and complete either an Elliott School or Honors senior seminar or a senior thesis. Students must apply for honors candidacy prior to the beginning of the senior year.

Students should consult the program guidelines available from the Elliott School for courses pertinent to Asian studies. Students should consult the program director concerning certain Special Topics or Selected Topics courses that may also be part of this program.

BIOLOGICAL SCIENCES

Professors R.K. Packer, R. Donaldson (*Chair*), J.R. Burns, D.L. Lipscomb, R.E. Knowlton, K.M. Brown
Associate Professors H. Merchant, D.E. Johnson, J.M. Clark, M.W. Allard, L.C. Smith, F.J. Turano, E.F. Wells, G. Hormiga, P.S. Herendeen, R.P. Tollo
Assistant Professors D.W. Morris, P. Hernandez, J.T. Lill, S.A. Church
Professorial Lecturer R.P. Eckerlin
Associate Professorial Lecturer P.E. Spiegler

Bachelor of Arts with a major in biology—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—BiSc 13–14 or equivalent.
3. Required courses in related areas: Chem 11–12, 151–52, and 153–54. (The following courses are strongly recommended: Phys 1–2 or 21–22; 3 credit hours of either mathematics or statistics; two years of an approved foreign language.)
4. Required courses for the major—A minimum of 24 credit hours of 100-level courses, which must include at least 4 hours from each of the following: cell and molecular biology (BiSc 102 to 109), suborganismal biology (BiSc 110 to 128), organismal biology (BiSc 130 to 145), and ecology and evolution (BiSc 150 to 169).

Bachelor of Science with a major in biology—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—BiSc 13–14 or equivalent.
3. Required courses in related areas—Chem 11–12, 151–52, and 153–54; Phys 1–2 or 21–22; 3 credit hours of either mathematics or statistics (this requirement cannot be satisfied by waiver). Two years of an approved foreign language are strongly recommended but not required.
4. Required courses for the major—A minimum of 30 credit hours of 100-level courses, which must include at least 4 hours from each of the following: cell and molecular biology (BiSc 102 to 109), suborganismal biology (BiSc 110 to 128), organismal biology (BiSc 130 to 145), and ecology and evolution (BiSc 150 to 169).

A maximum of 6 credit hours of research and independent study or graduate courses in biological sciences may be used as electives within the major.

Special Honors—In addition to the general requirements stated under University Regulations, in order to be considered for graduation with special honors, a student must maintain a cumulative 3.5 grade-point average in biological science courses and at least a 3.0 cumulative overall grade-point average. Students who meet these criteria and wish to pursue special honors must complete an approved research project under faculty direction.

Minor in biology—12 credit hours of 100-level courses (excluding research and independent study).

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Departmental prerequisite: BiSc 13–14 or equivalent is prerequisite to all 100-level courses except by permission of the instructor.

3 **The Diversity of Life** (3) Wells, Burns
Lecture (2 hours), laboratory (2 hours). Characteristics of the living world, including evolution; diversity of plants, animals, and microorganisms; ecology and the biosphere; animal behavior; and the biology of the human body. For non-majors. Laboratory fee, $45. (Fall)

4 **The Building Blocks of Life** (3) Packer, Donaldson
Lecture (2 hours), laboratory (2 hours). The molecules and cells that make up the human organism, nutrition and metabolism, inheritance and genetic diseases, bacterial and viral infections, immunity, biotechnology in medicine and food, economics and politics of biology. For non-majors. Laboratory fee, $45. (Spring).

13 **Introductory Biology: The Biology of Organisms** (4) Wells, Burns
Lecture (3 hours), laboratory (3 hours). Concepts and methods in the study of whole organisms. Evolutionary theory; population biology; diversity of plants, animals, fungi, and microorganisms; ecology and behavior; and animal structure and function. Laboratory fee, $55. (Fall)

14 **Introductory Biology: Cells and Molecules** (4) Packer, Donaldson
Lecture (3 hours), laboratory (3 hours). Nutrition and metabolism, cellular physiology, genetics, and molecular biology of plants and animals. Laboratory fee, $55. (Spring)

102 **Cell Biology** (3) Morris, Smith
Structure and function of biological molecules and cellular organelles; cellular interactions. Prerequisite: one semester of organic chemistry. (Fall and spring)

103 **Biochemistry** (4) Vanderhoek
Introduction to structures of biological macromolecules, enzyme catalysis, cellular bioenergetics, and metabolism. Prerequisite: Chem 151–52. Same as Bioc 101 and Chem 161. (Fall)

104 **Biochemistry Laboratory** (2) Vanderhoek
Study of common experimental techniques used in life science laboratories to separate and characterize biological macromolecules. Prerequisite: BiSc 103 or equivalent. Laboratory fee, $75. Same as Bioc 103 and Chem 163. (Spring)

105 **Plant Biochemistry** (3) Donaldson
Discussions of plant metabolism and molecular biology: photosynthesis, nitrogen metabolism, membrane transport, mechanisms of hormone action, protein targeting, biotechnology, and current research topics. Prerequisite: Chem 11–12. (Spring, even years)

106 **Special Topics in Biochemistry** (2) Vanderhoek, Donaldson, King
In-depth discussion of current biochemically relevant topics, including cancer and HIV chemotherapy, immune response, photosynthesis, signal transduction, hormone regulation and nutrition. Topics vary. Prerequisite: BiSc 103 or equivalent. Same as Bioc 102 and Chem 162. (Spring)

107 **Genetics** (3) Johnson
Introduction to genetics, with emphasis on the integration of transmission of genetic traits and the molecular basis of gene action. Also includes cytogenetics, gene regulation, and examples of current applications of genetic technology. (Fall and spring)

108 **Genetics Laboratory** (1) Johnson
Study of genetic principles and genetic and molecular techniques in Drosophila and *E. coli*. Prerequisite or concurrent registration: BiSc 107. Laboratory fee, $55. (Spring)

109 **Molecular Biology** (4) Turano
Overview of theories, techniques, and procedures associated with molecular biology; topics include the biosynthesis of DNA, RNA, and proteins, relationships among structure, function, and expression; and traditional and modern methods of gene and protein characterization and monitoring. Prerequisite: Chem 11–12. Laboratory fee, $55. (Fall)

110 **Developmental Plant Anatomy** (4) Staff
Demonstration, observation, discussion (6 hours). Initiation and ontogeny of tissues and organs of vascular plants. Laboratory fee, $55. (Spring, odd years)

112 **Immunology** (3) Staff
Introduction to mammalian immunology covering the progression of immune responses from initial pathogen contact to immune memory. Applied topics include autoimmunity, transplantation, and the effects of HIV on the immune system. Prerequisite: BiSc 102 and one semester of organic chemistry; BiSc 107 or 122 recommended. (Fall)

114 **Developmental Biology** (4) Brown
Lecture (2 hours), laboratory (4 hours). Embryonic development of animals. Principles are illustrated by modern experimental studies of developmental problems. Laboratory analysis of organ system formation in the sea urchin, frog, chicken, and pig. Laboratory fee, $55. (Fall)

115 **Experimental Developmental Biology** (4) Brown
Lecture (2 hours), laboratory (4 hours). Cell biochemistry and molecular biology of development. Laboratory exercises involve micromanipulative, biochemical, and molecular studies on animal embryos cultured in the lab. Prerequisite: BiSc 114 or equivalent, or permission of instructor. Laboratory fee, $55. (Spring, even years)

118 **Histology** (4) Burns
Lecture (2 hours), laboratory (4 hours). Introduction to microscopical anatomy of normal tissues and organs with emphasis on the interrelationship of structure and function. Laboratory fee, $55. (Spring)

120 **Human Neurobiology** (3) Bohn
Introduction to the anatomy and function of the human nervous system, gross and microscopic structure, embryology, and neurophysiology of the brain, spinal cord, and nerves; alterations caused by disease or injury. (Fall)

121 **Comparative Endocrinology** (3) Staff
Basic principles of chemical integration, neuroendocrine relationships, and mechanisms of hormone action. Prerequisite: BiSc 118 or 122. (Spring)

122 **Human Physiology** (3) Packer
Introduction to the function of organ systems of the human body. Prerequisite: Chem 11–12. (Fall)

123 **Human Physiology Laboratory** (1) Staff
Study of basic physiology laboratory techniques; emphasis on the experimental study of homeostatic mechanisms in humans. Prerequisite or concurrent registration: BiSc 122. Laboratory fee, $55. (Fall)

125 **Environmental Physiology** (3) Packer
Mechanisms of evolutionary adaptation and processes of acclimation by which animals respond to environmental challenges; emphasis on vertebrates. Prerequisite: BiSc 122 or 154. (Fall)

128 **Human Nutrition** (3) Staff
Dietary requirements and their underlying physiological and biochemical bases; composition of natural and modified foodstuffs and additives; social and economic aspects of nutrition. (Spring)

130 **Invertebrate Zoology** (4) Knowlton
Lecture (3 hours), laboratory (3 hours). General survey of invertebrate animals, including classification, morphology, physiology, embryology, and evolutionary relationships among phyla. Laboratory fee, $55. (Fall)

132 **Comparative Vertebrate Anatomy** (4) Hernandez
Lecture (2 hours), laboratory (4 hours). Evolution and comparative morphology of Phylum Chordata, stressing recent forms. Laboratory fee, $55. (Spring)

137 **Introductory Microbiology** (4) Morris
Lecture (2 hours), laboratory (4 hours). Survey of the major groups of microorganisms with emphasis on structure, physiology, ecology, pathogenesis, and biotechnology. Antibiotic resistance and emerging diseases. Prerequisite: one year of chemistry. Laboratory fee, $55. (Fall)

139 **Parasitology** (4) Eckerlin
Lecture (2 hours), laboratory (4 hours). Introduction to animal parasitology; survey of parasitic types from protozoa through arthropods. Laboratory fee, $55. (Fall)

140 **Taxonomy of Flowering Plants** (4) Wells
Lecture (2 hours), laboratory and field (4 hours). Origin, evolutionary development, and principles of systematics of flowering plants. Laboratory fee, $55. (Spring, even years)

142 **Flora of the Mid-Atlantic States** (4) Wells
Field trips and laboratory study of the identification and ecology of vascular plants of the Coastal Plain, Piedmont, and mountains of Delaware, Maryland, Virginia, and West Virginia. Emphasis on family characteristics and recognition of dominant species in native habitats. Laboratory fee, $55. (Summer)

150 **Organic Evolution** (3) Lipscomb
Synthetic theory of organic evolution, including population biology, speciation, adaptation, macroevolution, systematics, biogeography, and the geologic record. (Fall)

151 **History of Life** (3) Lipscomb
A review of the origin of life, the geologic record, and the evolutionary history of the major groups of organisms, including the evolution of bacteria, origin of animals and plants, evolution of invertebrates and vertebrates, adaptations of mammals, and the evolution of flowering plants. (Spring, odd years)

152 **Animal Behavior** (3) Staff
An evolutionary approach to the study of animal behavior, emphasizing behavioral ecology and sociobiology. (Spring)

153 **Plant–Animal Interactions** (3) Lill
Review of the major ecological and evolutionary interactions that occur between plants and animals in natural and managed ecosystems. BiSc 150 or BiSc 154 recommended. (Fall, even years)

154 **General Ecology** (4) Merchant
Lecture (3 hours), laboratory and field (3 hours). Introduction to the concepts of limiting factors, biogeochemical cycles, trophic levels, and energy transfer and their relationship to the structure and function of population, species, communities, and ecosystems. Laboratory fee, $55. (Fall)

155 **Plant Ecology** (4) Wells
Lecture (2 hours), laboratory (4 hours). Introduction to the ecology of plant populations, communities, and individuals. Two weekend field trips required. Laboratory fee, $55. (Fall, odd years)

156 **Animal Ecology** (4) Merchant
Lecture (3 hours), laboratory and field (3 hours). Application of ecological principles to the understanding and manipulation of animal populations. Prerequisite: BiSc 154 or permission of instructor. Laboratory fee, $55. (Spring, even years)

157 **Aquatic Ecology** (4) Merchant
Lecture (3 hours), laboratory and field (3 hours). Ecological principles applied to aquatic systems with special references to physiochemical properties, typical habitats, and communities. Laboratory fee, $55. (Spring, odd years)

158 **Field Botany** (4) Wells
Lecture (2 hours), laboratory and field (4 hours). Field and laboratory studies on vascular plants of the Coastal Plain, Piedmont, and mountains of the mid-Atlantic States. Two weekend field trips required. Laboratory fee, $55. (Fall, even years)

159 **Geobotanical Ecology of the Central Appalachians** (4) Tollo, Wells
A multidisciplinary approach to Appalachian ecology involving application of scientific principles from both geology and botany, stressing interrelationships between geological, geochemical, and biological processes. Biweekly field trips. Prerequisite: EES 1 or 5 and BiSc 13–14; or equivalent with permission of instructor. Same as EES 159. (Spring, odd years)

160 **Conservation Biology** (3) Lill
Theory and practice of conserving biological diversity. Ecological patterns of biodiversity, biology of small populations, and conservation case studies. Use of ecological modeling software to explore various topics. Prerequisite: BiSc 154 or permission of instructor. (Spring)

162 **Plant–Animal Interactions Laboratory** (1) Lill
Field and laboratory study of temperate interactions between plants and animals. Group projects focus on original data collection, analysis, and interpretation. Prerequisite or concurrent registration: BiSc 153. Laboratory fee, $55. (Fall, even years)

167 **Marine Biology** (4) Knowlton
Lecture (2 hours), laboratory (4 hours), plus some extended field trips. Study of relationships between organisms and physical, chemical, and biological factors

of the marine environment. Consideration of the open ocean and coastal ecosystems and human influences on them. Laboratory fee, $55. (Spring)

168 **Tropical Marine Biology** (4) Knowlton and Staff
Study of organism diversity and ecology in tropical marine ecosystems. Lectures and laboratory sessions on campus during the semester, followed by fieldwork on the island of San Salvador, Bahamas, during two weeks in June. Contact Department for information on course structure and additional associated costs. Laboratory fee, $275. (Spring, even years)

169 **Applied Marine Ecology** (4) Knowlton and Staff
Study of coastal boreal ecosystems with emphasis on human impacts. Some lectures and laboratory sessions on campus during the semester, followed by fieldwork along the Maine coast during three weeks in June. Contact Department for information on course structure and additional associated costs. Laboratory fee, $350. (Spring, odd years)

171 **Undergraduate Research** (arr.) Staff
Admission by permission of the staff member concerned. May be repeated for credit. Prerequisite: Chem 50 or 152; 16 credit hours in biological science courses. Laboratory fee, $50 per credit hour. (Fall and spring)

172 **Independent Study in Cell and Molecular Biology** (2) Donaldson, Morris
Prescribed reading list and consultations with staff advisor culminating in a written report and/or examination. Prerequisite: permission of instructor.

173 **Independent Study in Developmental Biology** (2) Brown, Burns, Hernandez
Prescribed reading list and consultations with staff advisor culminating in a written report and/or examination. Prerequisite: permission of instructor.

174 **Independent Study in Organismic Biology** (2) Knowlton, Wells
Prescribed reading list and consultations with staff advisor culminating in a written report and/or examination. Prerequisite: permission of instructor.

175 **Independent Study in Genetic and Evolutionary Biology** (2) Allard, Johnson, Lipscomb
Prescribed reading list and consultations with staff advisor culminating in a written report and/or examination. Prerequisite: permission of instructor.

176 **Independent Study in Environmental Biology** (2) Lill, Merchant, Wells
Prescribed reading list and consultations with staff advisor culminating in a written report and/or examination. Prerequisite: permission of instructor.

180 **Biotechnology** (3) Morris
Genetic engineering of bacteria, plants, and animals, including humans. Applications of modern biotechnology, especially in the field of medical biotechnology, such as gene therapy, xenotransplantation, and the Human Genome Project. Regulation, prospects, and social impact of biotechnology. Recommended: BiSc 102 or 107. Prerequisite: organic chemistry. (Spring and summer)

181 **Human Anatomy** (3) Walsh, Slaby, Bohn
The structural organization of the human body and how it relates to regional and systems-based functions. Emphasis on the macroscopic structure of the body. (Spring)

182 **Diversity and History of Plants** (4) Herendeen
Lecture (3 hours), laboratory (3 hours). A detailed investigation of the diversity, phylogeny, morphology, and fossil history of plants for advanced undergraduates and graduate students. Prerequisite: BiSc 140 or 150 or 151 or equivalent. (Fall, even years)

183 **Biology of Proteins** (2) Donaldson
About half of the proteins in the human genome have unknown functions. Are some related to cancers, muscle degeneration, infectious disease? How can evolutionary relationships among proteins from other organisms help us discover functions of unknown proteins? Prerequisite: AP or IB Biology or Chemistry. (Fall)

BUSINESS ADMINISTRATION

Requirements for the Bachelor of Business Administration degree are listed under the School of Business. The courses listed below form the business core for the B.B.A. degree. Several of these courses are required in the B.Accy. degree as well. BAdm courses are taught by faculty members schoolwide.

1–2 **First-Year Development Course** (0–0) Staff
Required of all first-year students in School of Business. This two-semester noncredit course is designed to enhance students' education and begin preparation for business careers. The course meets periodically during the semester. Course fee, $75 per semester. Restricted to School of Business freshmen.

51 **Introductory Financial Accounting** (3) Jones, Tarpley
Basic knowledge of financial accounting concepts and standards as an essential part of the decision-making process for the management of private investment and for business and government organizations. Same as Accy 51. Prerequisite: sophomore standing. (Fall and spring)

52 **Introductory Managerial Accounting** (3) Kumar and Staff
Basic knowledge of managerial accounting concepts, procedures, analyses, and internal reports as an essential part of the decision-making process for public and private-sector organizations. Prerequisite: Accy/BAdm 51. (Fall and spring)

53 **Management, Organizations, and Society** (1.5) Geranios
Introduction to the manager and the management process in the context of organizations and society. Focus on effective management of the corporation in a changing society. Prerequisite: sophomore standing. (Fall and spring)

55 **Fundamentals of Business Law** (1.5) Kane
Overview of the American legal system with reference to business law and the Universal Commercial Code. Key legal concepts such as contracts and torts. The role of courts: regulation, litigation, and constitution issues. (Fall and spring)

64 **Management Information Systems Technology** (3) Granger, Sahasrabudhe
An introduction to data and information processing concepts and systems viewed from a contemporary management perspective. Emphasis on uses and applications as well as emerging managerial issues with the potential to reshape the form and function of information systems. Lab required. Prerequisite: basic knowledge of Microsoft Word, Excel, and PowerPoint. (Fall and spring)

66 **Organizational Behavior** (3) Kayes
Introduction to concepts of psychology and the social dynamics that characterize organizations. Decision making, motivation, attitudes, teamwork, power, and leadership. An experiential laboratory component uses case discussions and exercises to illustrate applications of theory and concepts. Restricted to School of Business freshmen. (Fall and spring)

110 **Basic Marketing Management** (3) Achrol, Liebrenz-Himes, Smith, Perry
Consumer and organizational buying behavior. Strategic marketing processes (market research, segmentation, targeting, positioning, and relationship-building). Product development and brand management, valuation and pricing, channel and logistics management, integrated marketing communications, e-commerce. Prerequisite: Econ 12; Stat 51. (Fall, spring, and summer)

115 **Financial Management and Markets** (3) Locke, Jostova
Introduction to financial markets, investment analysis, and financial management. Financial analysis, risk management, working capital management, capital budgeting, financial structure, cost of capital, and dividend policy. Prerequisite: BAdm 51; Econ 12; Math 32 (or 51, 52); Stat 51 or 53. (Fall and spring)

120 **Operations Management** (3) Perry, Bagchi, White, Matta
Production planning concepts and analytical tools. Designing and managing production processes: facilities, equipment, process control systems. Design issues, demand forecasting, material planning, acquisition techniques. Managing the factory floor: scheduling, total quality management, continuous improvement concepts and methods. Prerequisite: Stat 51. (Fall and spring)

130 **Human Resource Management** (3) Swiercz, Goldberg, Gowan
How human resource management policies and practices affect the achievement of organization objectives: human resource planning, recruitment, selection, training, development, compensation, and unionism and collective bargaining. Prerequisite: Econ 12 and junior standing. (Fall, spring, and summer)

135 **Change and Organizations** (1.5) Geranios
An exploration of the forces of change that drive organization adaptation. Consideration of both the underlying phenomena and design implications for the organization life cycle, technology change, globalization, competition drivers, and increasing service requirements. (Fall and spring)

145 **International Financial Environment** (1.5) Rehman, Yang, Click
Assessment of international economic and financial developments as they affect international corporate activity. Conceptual issues and current developments in the international financial environment, including an overview of international economic systems, international financial systems, and global financial markets. Prerequisite: Econ 12. (Fall and spring)

150 **Business and Government Relations** (3) Burke, Griffin, Rivera
Economic and legal environment of business enterprise; social and political influences; contemporary problems and issues. Restricted to seniors in the B.B.A. and B.Accy. programs. (Fall and spring)

190 **Special Topics** (1 to 3) Staff
Experimental offering; new course topics and teaching methods.

195 **Internship** (0)
School of Business undergraduates may register for this course when they wish to have an internship recorded on the transcript. The supervisor must verify that the internship has been completed for a minimum of six hours per week. A $25 administrative fee is charged. May be repeated each semester if desired.

197 **Strategy Formulation and Implementation** (3) Davis, Thurman, Cook, Starik, Burke, Teng
An integrative capstone course to develop skills in diagnosing organizational problems, formulating and selecting strategic alternatives, and recognizing problems inherent in strategy implementation. Restricted to seniors in the B.B.A. and B.Accy. programs. (Fall and spring)

199 **Independent Study** (1 to 6) Staff
Assigned topics with interdisciplinary focus. Admission by prior permission of advisor. May be repeated once for credit but in a separate semester.

CHEMISTRY

Professors D. Ramaker, M. King (*Chair*), A. Montaser, J.H. Miller, A. Vertes
Associate Professor M.J. Wagner
Assistant Professors C.L. Cahill, M.G. Zysmilich, L.P. Eisen, V. Sadtchenko, H.H. Teng, Z. Xu
Instructor J. Hilderbrandt

Bachelor of Arts or Bachelor of Science with a major in chemistry—The department offers four undergraduate majors, all designed to give students a broad background in the basic divisions of chemistry: analytical, inorganic, organic, and physical. Major I, while providing considerable concentration in chemistry, permits a wider selection of electives. It thus should meet the needs of students preparing to enter medicine, dentistry, law, or related fields. Major II is intended primarily for students preparing for graduate study in chemistry or those planning to enter the chemical profession and wishing to be certified by the American Chemical Society as having met the minimum requirements for professional training. Major III is a program in forensic chemistry and prepares students to meet the needs of federal and state forensic sciences laboratories. Major IV includes additional work in biochemistry and fulfills the American Chemical Society requirement for a certified degree program in chemistry with a biochemistry option.

The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses for the Bachelor of Arts degree for all majors—Chem 11–12 or Honr 33–34; Chem 22 and 23; Math 31 and 32; Phys 21–22. Majors intending a Bachelor of Science degree must take two additional semesters of approved course work in the natural sciences or mathematics, such as BiSc 13–14 or EES 1 and 5.
3. (a) Required courses for Major I—Chem 111–12, 113, 122, 134, 151–52, 153–54, 161, 153–54, 161, 195 (for a total of 3 credits). A course in a structured computer programming language, such as Stat 129 or CSci 49, 50, 100, or 102, is recommended.
   (b) Required courses for Major II—Chem 111–12, 113, 122, 123, 134, 151–52, 161; BiSc 13–14; ForS 224, 225, 269, 273, and 280 or their equivalents.
   (c) Required courses for Major III—Chem 111–12, 113, 122, 134, 151–52, 153–54, 153–54, 161, 162, 163, 195; BiSc 13–14. BiSc 102, 107, and 122 are recommended.
   (d) Required courses for Major IV—Chem 111–12, 113, 122, 123, 134, 151–52,

An entering student who is considering chemistry as a major should consult a Chemistry Department advisor regarding the program of study for the first two years. In general, the following sequence of courses is recommended for those students considering Major II:

first year—Chem 11–12 or Honr 33–34, Math 31 and 32 (or 20–21 if necessary); second year—Chem 22, 151–52, and 153–54, Phys 21–22, Math 32 if not taken in first year; third year—Chem 23, 111–12, 113; fourth year—Chem 122, 123, 134, 161 (if not taken in the junior year), 195. Major I, Major III, and Major IV students should follow this sequence in general and are urged to consult with the chemistry and premedical advisors concerning their academic programs.

Special Honors—In addition to meeting the general requirements stated under University Regulations, a candidate for graduation with Special Honors in chemistry must maintain a cumulative 3.0 grade-point average in chemistry courses and take Chem 195 for at least 3 credits over two semesters. In addition to the final report for Chem 195, a poster or oral presentation is required.

Five-Year Bachelor of Science with a major in chemistry/Master of Forensic Sciences with a concentration in forensic chemistry—A program leading to the B.S. in the field of chemistry and M.F.S. with a concentration in forensic chemistry is available. Interested students should consult the Chemistry Department early in the junior year.

Minor in chemistry—Required: Chem 11–12 or Honr 33–34; Chem 22, 23, 110 or 111, 151–52, and 153–54.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Note: Upon consultation with course instructors, specific course prerequisites may be waived. Chem 11–12 and Honr 33–34 are related in their subject matter, and credit for only one of these sets of courses can be earned toward a degree.

PHYSICAL SCIENCE

3–4 **Contemporary Science for Nonscience Majors** (3–3) Zysmilich and Staff
Contemporary topics in physical, biological, and medical science. Chem 3 is not prerequisite to Chem 4. Laboratory fee, $55 per semester. (Academic year)

CHEMISTRY

11–12 **General Chemistry** (4–4) Hilderbrandt, Cahill, Sadtchenko, Eisen
Atomic structure and properties; stoichiometry; gas, liquid, and solid state; chemical bonding; solutions; chemical kinetics and equilibria; thermodynamics; acids and bases; electrochemistry; descriptive chemistry. Prerequisite to Chem 11: one year of high school algebra. Prerequisite to Chem 12: Chem 11. Laboratory fee, $55 per semester. (Chem 11 and 12—fall and spring)

22 **Introductory Quantitative Analysis** (3) Vertes
Theory and practice of quantitative analysis by modern methods; evaluation of analytical data emphasizing detection and correction of experimental errors. Correlated with Chem 23. Prerequisite: Chem 12. (Spring)

23 **Introductory Quantitative Analysis Laboratory** (1) Sadtchenko
Laboratory complement to Chem 22. Prerequisite or concurrent registration: Chem 22. Laboratory fee, $55. (Fall)

105 **Environmental Chemistry** (3) Miller
Chemistry and physics of the environment, with emphasis on water and air pollution; environmental analysis and modeling and their limitations. (Fall)

110 **Introduction to Physical Chemistry** (3) Ramaker
Gas, solid, and liquid state, chemical thermodynamics, solutions, chemical equilibrium, kinetics, quantum chemistry, spectroscopy, and macromolecules. Prerequisite: Chem 22; Math 31; Phys 2 or 22; or permission of instructor. Not open to chemistry majors. May not be taken for credit by students who have received credit for Chem 111–12 or an equivalent course. (Fall)

111–12 **Physical Chemistry** (3–3) Ramaker, Wagner, Miller
Gas laws, chemical thermodynamics, chemical equilibrium, kinetics, quantum chemistry, atomic and molecular spectra, structure of solids, liquids, and macromolecules. Prerequisite to Chem 111: Chem 22; Math 31; Phys 22; or permission of instructor. Prerequisite to Chem 112: Chem 111. (Academic year)

113 **Physical Chemistry Laboratory** (2) Miller, Ramaker, Wagner, and Staff
Laboratory complement to Chem 111. Prerequisite or concurrent registration: Chem 23, 111. Laboratory fee, $55. (Spring)

122 **Instrumental Analytical Chemistry** (3) Montaser, Vertes
Theory of instrumental methods in qualitative and quantitative analysis, determination of structure, with emphasis on atomic and molecular spectrophotometry, infrared spectroscopy, nuclear magnetic resonance, mass spectrometry, chromatography, and electroanalysis. Correlated with Chem 123. Prerequisite or concurrent registration: Chem 111 or permission of instructor. (Fall)

123 **Instrumental Analytical Chemistry Laboratory** (2) Wagner, Sadtchenko
Laboratory complement to Chem 122. Prerequisite or concurrent registration: Chem 111 and 122. Laboratory fee, $55. (Fall)

134 **Descriptive Inorganic Chemistry** (3) Cahill
Intermediate-level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chem 22, 23, and 152. (Spring)

141 **Experimental Chemistry** (3) Staff
Experimental methods common to all disciplines of chemistry. Use of the chemical literature; operation of chromatographic and spectroscopic instrumentation; interpretation of spectra by correlation methods. Prerequisite: Chem 152 and 154. Laboratory fee, $55. (Fall and spring)

151–52 **Organic Chemistry** (3–3) King, Xu, and Staff
Systematic treatment of the structure, preparation, properties, and reactions of the principal classes of organic compounds. Fundamental principles of stereochemistry, reaction mechanisms, and spectroscopic methods of analysis. Prerequisite to Chem 151: Chem 12. Prerequisite to Chem 152: Chem 151. (Academic year)

153–54 **Organic Chemistry Laboratory** (1–1) King and Staff
Laboratory complement of Chem 151–52. Introduction to and practice in basic skills of synthesis, separation, purification, and identification of organic compounds. Prerequisite or concurrent registration: Chem 151–52. Prerequisite to Chem 154: Chem 153. Laboratory fee, $55 per semester. (Academic year)

161 **Biochemistry** (4) Vanderhoek
Prerequisite: Chem 151–52. Same as Bioc 101 and BiSc 103. (Fall)

162 **Special Topics in Biochemistry** (2) Vanderhoek, Donaldson, and Staff
Prerequisite: Chem 161. Same as Bioc 102 and BiSc 106. (Spring)

163 **Biochemistry Laboratory** (2) Vanderhoek
Prerequisite: Chem 161. Laboratory fee, $75. Same as Bioc 103 and BiSc 104. (Spring)

193 **Chemical Instrumentation** (3) Montaser
Electronic analog measurements and control of electrical quantities in chemical instrumentation; digital and analog data conversion and optimization of electronic measurements in chemical instrumentation; computer interfacing and programming using PC-based systems. Prerequisite: Chem 112 and 122. Laboratory fee, $35. (Fall)

195 **Undergraduate Research** (1 or 2) Staff
Research on problems approved by the staff. Approval must be obtained prior to registration. A final written report on the work is required. For students requesting Special Honors in chemistry, a poster or oral presentation is also required. May be repeated for credit. Majors are encouraged to take the course for two semesters. Laboratory fee, $55. (Fall and spring)

CHINESE

See **East Asian Languages and Literatures.**

CIVIL AND ENVIRONMENTAL ENGINEERING

Professors K. Mahmood, M.I. Haque, K.H. Digges (*Research*), A. Eskandarian, K. Roddis (*Chair*)
Associate Professors V. Motevalli, R. Riffat, M.T. Manzari
Assistant Professors C.D. Kan (*Research*), S.S. Badie
Adjunct Professors B. Whang, M.O. Critchfield, C. Smith
Professorial Lecturer G.C. Everstine

See the School of Engineering and Applied Science for the programs of study leading to the Bachelor of Science with a major in civil engineering.

1 **Introduction to Civil and Environmental Engineering** (1) Manzari and Staff
An introduction to the profession of civil and environmental engineering. Field visits and laboratory exercises complement classroom instruction. (Fall)

117 **Engineering Computations** (3) Mahmood, Kaufman
Numerical methods for engineering applications. Methods for solving systems of linear equations, root finding, curve fitting, and data approximation. Numerical differentiation and integration and numerical solution of differential equations. Computer applications. Prerequisite: CSci 50. (Fall)

120 **Introduction to the Mechanics of Solids** (3) Haque and Staff
Stress and strain, axial load problems, torsion, shear force and bending moment, pure bending of beams, shearing stresses in beams, compound stresses, analysis of plane stress and plane strain, combined stresses, deflection of beams, statically indeterminate problems, columns, energy methods. Prerequisite: ApSc 57, 113. (Fall and spring)

121 **Structural Theory I** (3) Manzari and Staff
Theory of statically determinate structures; stability and determinacy; influence lines and moving loads. Analysis of roof systems and cable structures. Calculation of deflections. Approximate methods of analysis of indeterminate structures. Prerequisite or concurrent registration: CE 120. (Fall)

122 **Structural Theory II** (3) Manzari and Staff
Theory of statically indeterminate structures using matrix methods and classical approaches such as moment distribution and slope-deflection; influence lines; energy methods. Prerequisite: CE 121. (Spring)

166 **Materials Engineering** (2) Gilmore, Haque
Mechanical properties, plastic deformation dislocation theory, yielding, strengthening mechanisms, microstructure and properties, heat treatment of steel, composites, amorphous materials, viscoelastic deformation, creep, fracture, fatigue, fatigue crack propagation. Prerequisite: ApSc 130; concurrent registration: CE 120. Same as MAE 166. (Fall)

167 **Mechanics of Materials Laboratory** (1) Gilmore, Haque
Measurement of strains and study of failure resulting from applied forces in ductile, brittle, anisotropic, elastomeric, plastic, and composite materials. Study of tension, compression, bending, impact, and shear failures. Prerequisite or concurrent registration: CE 166. Same as MAE 167. (Fall)

168 **Introduction to Geotechnical Engineering** (3) Manzari and Staff
Soils and rock formation, soil composition, permeability, seepage and flow net-analysis, stresses in soil medium, consolidation and settlement, shear strength of soil, analysis of lateral earth pressures, soil compaction. Prerequisite: CE 120, MAE 126. (Fall)

170 **Introduction to Transportation Engineering** (3) Eskandarian
Introduction to the principles and applications of transportation planning, geometric design of highways, traffic operation analysis, construction of highway facilities, and intelligent transportation systems. Prerequisite: junior standing. (Fall)

171 **Highway Safety Analysis and Design** (3) Eskandarian
Principles of safety and applications to geometric design of highways and construction of highway facilities, roadside safety features standards, testing and design, statistical analysis of highway safety data and accident reconstruction, human and vehicle issues, and evaluation of safety improvements. Prerequisite: junior standing. (Spring)

185 **Geotechnical Engineering Laboratory** (1) Manzari and Staff
Laboratory experiments to evaluate liquid and plastic limits, grain-size distribution, shear strength, compressibility, permeability, and moisture–density relationship of soils. Prerequisite or concurrent registration: CE 168. (Fall)

188 **Hydraulics Laboratory** (1) Motevalli and Staff
Laboratory experiments and demonstrations for stability of floating bodies, Bernoulli's theorem, velocity, and pressure measurements in pipe and flume. (Spring)

189 **Environmental Engineering Laboratory** (1) Riffat and Staff
Laboratory experiments for physical and chemical analyses of water and wastewater. Measurement of turbidity, alkalinity, dissolved oxygen, BOD, COD, sus-

pended solids, and optimum coagulant dose using jar tests. Prerequisite or concurrent registration: CE 194. (Fall)

190 **Contracts and Specifications** (2) Manzari and Staff
Law of contracts, construction contracts, specifications, bidding, insurance and bonds, professional liability, arbitration of disputes, litigation. (Spring)

191 **Metal Structures** (3) Badie and Staff
Principles of the design of metal structures, structural elements, connections, specific problems of analysis, methods of construction, professionalism in design. A design project, including the use of computer software and a detailed report, is required. Prerequisite or concurrent registration: CE 122. (Fall)

192 **Reinforced Concrete Structures** (3) Badie and Staff
Properties of concrete and reinforcement; design of shear reinforcement; development of reinforcement; design of columns, floor slabs and building frames; ethics and professionalism in design. A design project, including the use of computer software and a detailed report, is required. Prerequisite or concurrent registration: CE 122. (Spring)

193 **Hydraulics** (3) Mahmood and Staff
Fluid statics: pressure forces, buoyancy, and flotation. Application of kinematic principles; flow fields, stream tubes, and flow nets. Fluid dynamics: applications to pipe flow, hydraulic models, measurement of pressure, and velocity. Open channel flow: applications to water resources engineering. Prerequisite: MAE 126. (Spring)

194 **Environmental Engineering I: Water Resources and Water Quality** (3) Riffat and Staff
Physical and chemical analyses of water quality and characteristics. Microbiology of water and pathogens. Introduction to water treatment processes involving coagulation, flocculation, filtration, and disinfection. Prerequisite or concurrent registration: CE 193. (Spring)

195 **Hydrology and Hydraulic Design** (3) Haque and Staff
Descriptive hydrology: hydrologic cycle, precipitation, stream flow, evaporation, and transpiration. Quantitative hydrology: hydrograph analysis, hydrographs of basin outflow, storage routing. Probability concepts in hydrology: flood frequency, rainfall frequency, stochastic hydrology. Culverts and stilling basins. Prerequisite or concurrent registration: ApSc 115, CE 193. (Fall)

196 **Design and Cost Analysis of Civil Engineering Structures** (3) Manzari, Badie, and Staff
Total structural systems concepts. Design of civil engineering structures such as piers, wharves, bulkheads, offshore platforms, dams, and other special structures. Principles of cost analysis for timber, steel, and reinforced concrete structures. Project and report are required. Prerequisite: senior status. (Spring)

197 **Environmental Engineering II: Water Supply and Pollution Control** (3) Riffat and Staff
Introduction to wastewater treatment systems including clarification, suspended and attached growth processes. Use of dissolved oxygen models. Water supply and wastewater collection systems, applied hydraulics of pipelines and pumps. Planning to meet quality needs and regulatory requirements. Prerequisite: CE 194. (Fall)

198 **Research** (1 to 3) Staff
Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

199 **Special Topics** (1 to 6) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

CLASSICAL AND SEMITIC LANGUAGES AND LITERATURES

Professors J.E. Ziolkowski, E.A. Fisher
Associate Professor E.H. Cline (*Chair*)
Assistant Professors M.D. Ticktin, Y.M. Moses, Y. Peleg, M. Esseesy

Bachelor of Arts with a major in classical humanities—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.

2. Prerequisite courses—Latn or Grek 1–2, 3–4, or equivalent, and Clas 71, 72. (Subject to departmental approval, Hmn 1 or Honr 15 may be taken in place of either Clas 71 or 72.)
3. Required courses in the major—(a) 12 credit hours selected from 100-level Latin, Greek, or approved classical studies courses; (b) 18 credit hours selected from AH 101, 102, 111, 112, 155; Hist 107, 108, 109, 110, 111; Ling 101; Phil 111; PSc 105; Rel 143.

Special Honors—In addition to the general requirements stated under University Regulations, in order to be considered for graduation with Special Honors, a student must (1) have attained a 3.7 grade-point average in the major and at least a 3.25 average overall by the end of the junior year, and (2) no later than the beginning of the senior year consult a departmental faculty member about a research project to be prepared under the supervision of that faculty member. Only if a committee of two faculty members approves the completed project will Special Honors be recommended; the research project must be graded *A* or *A–*.

Minor in classical humanities—(a) 6 credit hours selected from Latn or Grek 1–2; (b) 9 credit hours selected from Latn or Grek 3–4, 103, 104; Clas 71, 72, 105, 107, 108, 113, 117, 118, 119, 120, 127, 170, 185, 186; (c) 6 credit hours selected from AH 101, 102, 111; Hist 107, 108, 109, 110.

ARABIC

1–2 **First-Year Arabic** (4–4) Staff
Fundamentals of speaking, understanding, reading, and writing of Modern Standard Arabic. (Academic year)

3–4 **Second-Year Arabic** (4–4) Staff
Continuation of Arab 1–2. Further development of speaking, understanding, reading, and writing skills of Modern Standard Arabic. Prerequisite: Arab 1–2 or equivalent. Laboratory fee, $50 per semester. (Academic year)

9–10 **Third-Year Arabic** (3–3) Staff
Continuation of Arab 3–4. Further development of speaking, understanding, reading and writing skills of Modern Standard Arabic. Prerequisite: Arab 3–4 or equivalent. Laboratory fee, $50 per semester. (Academic year)

103 **Modern Arabic Literature—Nonfiction** (3) Staff
Practice and continued development of language skills, utilizing articles from current newspapers, magazines, journals, plus SCOLA broadcasts and video presentations. Prerequisite: Arab 3–4 or permission of instructor. Laboratory fee, $50. (Fall)

104 **Modern Arabic Literature—Fiction** (3) Staff
Study of selected fiction in Modern Standard Arabic. Practice and continued development of language skills; short essay writing. Prerequisite: Arab 103 or equivalent and permission of instructor. Laboratory fee, $50. (Spring)

GREEK

1–2 **Beginning Greek: Classical** (4–4) Staff
Study of the grammar, vocabulary, and structure of ancient Greek. Reading of selected ancient authors. (Alternate academic years)

3–4 **Intermediate Greek: Classical** (3–3) Staff
Reading of ancient Greek prose or poetic works (e.g., selections from Homer, Plato, Euripides). Review of grammar. Prerequisite: Grek 1–2 or equivalent. (Alternate academic years)

103–4 **Major Greek Authors** (3–3) Staff
Selections from a wide variety of Greek prose, drama, and poetry, suited to the needs of the class. May be repeated for credit with permission of instructor. Prerequisite: Grek 4 or equivalent.

HEBREW

1–2 **Beginning Hebrew** (4–4) Staff
An active presentation of Hebrew as it is spoken and written today. Comprehension, speaking, reading, and writing skills are stressed. Laboratory fee, $50 per semester. (Academic year)

3–4 **Intermediate Hebrew** (4–4) Staff
Further development of skills in speaking, reading, writing, and comprehension of modern Hebrew. Texts range from Israeli newspaper items to selections from classical materials. Prerequisite: Hebr 1–2 or equivalent. Laboratory fee, $50 per semester. (Academic year)

103 **Modern Hebrew Nonfiction** (3) Staff
Directed readings in humanities and social sciences. Development of linguistic skills necessary for independent research. May be repeated for credit. Prerequisite: Hebr 4 or permission of instructor. (Fall)

104 **Modern Hebrew Fiction** (3) Staff
Study of selected modern Israeli short stories and poems. Prerequisite: Hebr 103 or permission of instructor. (Spring)

106 **The Israeli Media** (3) Staff
Explores the Israeli press, television and radio news broadcasts in Hebrew; focuses on developing increasing proficiency in reading and aural comprehension through class discussions and written assignments in Hebrew. Prerequisite: Hebr 103 or permission of instructor. (Spring)

120–21 **Advanced Hebrew Literature** (3–3) Staff
Selections from Hebrew literature throughout the ages: Bible, Rabbinics, medieval Hebrew literature; classical motifs in modern Israeli literature. Literary analysis (writing and discussion) in Hebrew. Prerequisite: Hebr 104 or permission of instructor. (Academic year)

LATIN

1–2 **Beginning Latin** (3–3) Staff
Grammatical essentials of Latin, appropriate reading selections, development of English derivatives, introduction to Roman life and literature. (Academic year)

3 **Intermediate Latin: Prose and Poetry** (3) Staff
Development of ability to read and understand Latin literature of moderate difficulty. Prerequisite: Latn 1–2 or equivalent. (Fall)

4 **Vergil's Aeneid** (3) Staff
Significant passages of Vergil's famous epic in Latin; reading and discussion of the entire poem in translation. Prerequisite: Latn 3 or permission of instructor. (Spring)

103–4 **Major Latin Authors** (3–3) Staff
Selections from one or two major authors will be read each semester. May be repeated for credit. Prerequisite: Latn 3, 4; or permission of instructor. (Academic year)

YIDDISH

1–2 **Yiddish for Reading and Conversation** (3–3) Ticktin
Grammatical essentials of the language, appropriate reading selections, conversational exercises for beginners. (Alternate academic years)

CLASSICAL STUDIES (in English)

63 **Medical Terms from Greek and Latin** (3) Staff
Mastery of medical terminology by learning word elements from Greek and Latin and the principles that govern both the formation of medical words and the derivation of their meanings.

71 **Greek Literature and Civilization** (3) Staff
Study of ancient Greek civilization with focus on public and private life as seen primarily through literature. (Fall)

72 **Roman Literature and Civilization** (3) Staff
Study of Roman civilization with focus on public and private life as seen primarily through literature. (Spring)

81 **Classical Islamic Literature** (3) Staff
A survey of pre-modern Islamic literature, including translations of poetry, prose, popular literature, and selections from the Quran. Topics such as mys-

ticism, court literature, travel literature, urban mercantile literature, etc., are explored from the Arabic tradition as well as from the Persian and Turkish/Ottoman traditions.

82 **Modern Middle Eastern Literature** (3) Staff
20th-century literature of the Middle East (prose, poetry, short stories, novels), beginning with its 19th-century modernization and emphasizing various themes (e.g., alienation, exile, etc.).

100 **Modern Hebrew Literary Classics** (3) Staff
Prose and poetry of a century of writing from the beginning of the Hebrew literary renaissance to contemporary Israeli literature, including works of Bialik, Agnon, Hazaz, Amichai, Oz, and Yehoshua. Discussions stress historical development and authors' treatments of tradition and modernity.

101 **Israeli Society and Culture: Literary Perspectives** (3) Staff
A study of literature reflecting such contemporary issues as the conflict between the "builders' generation" and their children; the cultural contacts of Ashkenazim and Sefardim; image of the Arab; impact of the Holocaust; Zionist ideals and current realities. (Fall)

105 **Special Topics** (3) Staff
Topics in Arabic, Greek, Hebrew, Roman, and Yiddish literature; topics announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

107 **Greek and Roman Mythology** (3) Staff
The creation of the world, the nature of the gods, and the adventures of heroes as described in various Greek and Roman literary sources (e.g., epic, drama, hymns) and as shown in ancient art. (Fall)

108 **Approaches to Classical Mythology** (3) Staff
Selected myths examined through various disciplinary approaches, such as archaeology, psychology, history, comparative literature, and women's studies. Prerequisite: Clas 107 or equivalent. (Spring)

113 **Greek and Roman Drama** (3) Staff
Study of Greek and Roman tragedy and comedy; the nature and setting of dramatic performance in classical antiquity.

117 **The Ancient Near East and Egypt to 322 B.C.** (3) Cline
Same as Hist 107.

118 **History of Ancient Israel** (3) Cline
Same as Hist 108.

119 **Early Aegean and Greek Civilizations to 338 B.C.** (3) Staff
Same as Hist 109.

120 **The Roman World to 337 A.D.** (3) Staff
Same as Hist 110.

127 **Classical Influence on Western Civilization** (3) Ziolkowski
A survey of Greek and Roman influence on Western civilization, especially in architecture, language, literature, and science. Prerequisite: a course in classical literature or history.

170 **Issues of Gender in Classical Antiquity** (3) Staff
In-depth study and discussion of readings from ancient and modern sources on women and gender difference in Greek and Roman society.

185–86 **Directed Project** (1, 2, or 3) Staff
Individual advanced reading or research, to be arranged with a member of the faculty. May be repeated for credit. Admission by permission of instructor and department.

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

The Columbian College Proseminar for Scholarship and Advising is a requirement for Columbian College freshmen in their first semester. A faculty member serves as the proseminar leader with a team that includes members of the University's professional and administrative staff and student peer advisors.

10 **Proseminar for Scholarship and Advising** (0) Staff
For entering Columbian College freshmen, providing an introduction to scholarship in the liberal arts and sciences, promoting effective participation in a richly diverse academic community, and encouraging an enlightened self-sufficiency in the selection of courses and majors. Graded on a *P/NP* basis only.

COMMUNICATION

Professors C. Warren, L. Offermann
Associate Professors E.B. Davis, G.E. Dehler, D.P. Costanza (*Chair*), G. Selby
Assistant Professors J.C. Miller, N. Olsen, N. Vasilopoulos, A.J. Critchfield, G. Debebe, T. Dumas
Assistant Professorial Lecturers P. McKenzie, R. McKelvy, Q. Ahmed, A. Bresnahan, S. Burgoyne

The communication major is offered by the newly established Department of Organizational Sciences and Communication. Students are accepted as communication majors through a selective application process. Students are encouraged to apply during the first semester, or early in the second semester, of their sophomore year. Applications are not accepted from students with more than 75 credit hours. A student may apply no more than twice to the major. Minimum requirements for admission include a GPA of 3.3 and completion of, or current enrollment in, one of three courses: Comm 25, 40, or 41. Achievement of the minimum GPA does not guarantee admission to the major, because the acceptance process is selective. Application forms and the Student Handbook for Communication Majors, which provides additional information about the major, including the application process, are available in the program office.

Bachelor of Arts with a major in communication—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in the major: Comm 25, 40, 41, 100, 110, 150, 199; 18 additional hours of 100-level courses in communication, as approved by the major advisor.
3. Required courses in related areas: 15 credit hours of 100-level courses in one other department, program, or field of study, as approved by the major advisor.

Special Honors—Seniors majoring in communication may apply for Special Honors if they meet the following criteria: (1) the Special Honors requirements stated under University Regulations; (2) the requirements for selection to Lambda Pi Eta, the National Communication Association Honor Society, which maintains a chapter in the GW Communication Program (i.e., open to majors who have completed a minimum of 24 hours in communication course work, who hold a grade-point average of 3.3 in communication courses and a grade-point average of 3.0 overall, and who are recommended by a majority of the full-time communication faculty); and (3) a grade of *A* received on the thesis required in Comm 199, Senior Seminar.

Minor in communication—Required: 18 credit hours, including Comm 25, 40 or 41, 120, 150, and two 100-level electives in communication.

Minor in organizational communication—Required: 18 credit hours, including Comm 170, 171; OrSc 109; Psyc 144; plus two courses selected from Comm 120, 140, 173, 174, 176; Psyc 119.

25 **Introduction to Communication Studies** (3) Miller
Introduction to historical and intellectual development of the field. Students survey the origins of contemporary theory; learn about fundamental concepts, models, investigative tools, and contexts of communication; and explore a variety of professional opportunities awaiting communication graduates.

40 **Public Communication** (3) McKelvy, Miller, Ahmed, McKenzie
Study and practice of the basic techniques of public speaking used to inform, to entertain, and to persuade audiences. Emphasis on the speech-building process: audience analysis, research, development, composition, organization, style, delivery, and criticism.

41 **Interpersonal Communication** (3) Burgoyne, McKenzie
Study and practice of the role of verbal and nonverbal communication in ritual, information and perspective sharing, problem solving, and relationship formation, maintenance, and dissolution. Designed to raise awareness of the complexity and power of the communication process in daily life and to help students develop their interpersonal skills cognitively, affectively, and behaviorally.

42 **Business and Professional Speaking** (3) Ahmed
Study of the communication process in business and professional organizations; practice in interviewing, small group communication, and public presentations. For non-majors and non-minors only.

100 **Communication Theory** (3) Staff
Inquiry into the nature and function of communication theory as a framework for the study of communicative behavior. Emphasis is placed on analysis of paradigmatic approaches in rhetorical, interpersonal, and mass communication theories and models, and on examination of contemporary research literature in communication. Prerequisite: Comm 25.

110 **Research Methods** (3) Selby
Processes of inquiry within interpersonal and public communication. Students are introduced to concepts of framing research questions, conducting literature reviews, developing a research design, using qualitative and quantitative research tools, and interpreting results of research in communication. Prerequisite: Comm 100.

120 **Small Group Communication** (3) Warren, Selby
The study and practice of communication in small groups, focusing on problem solving, norms, roles, and leadership. Prerequisite: Comm 25 or permission of the instructor.

140 **Nonverbal Behavior** (3) Burgoyne
Introduction to predominant theories, principles, and problems in the study of nonverbal behavior; application of research results to everyday life. Topics include facial expression, eye behavior, physical appearance, body movement and gestures, tactile messages, vocal characteristics, use of time, spatial dynamics, gender and life-stage differences.

150 **Persuasion** (3) Warren
In-depth study of the principles and techniques of persuasion from both production and consumption perspectives, in both personal and mediated contexts. Emphasis on the common-premise model, with consideration of such topic areas as pathos/ethos/logos, attitude and behavior change, effectiveness, ethics, and subconscious influence. Prerequisite: Comm 25.

170 **Organizational Communication** (3) Critchfield
Exploration of the philosophy, process, problems, and potential of human communication within organizational contexts. May involve experiential workshops and fieldwork. Prerequisite: Comm 41 or 120 or permission of instructor.

171 **Professional Communication** (3) Staff
Principles and theories of communication applied to situations encountered in organizational and professional environments. Development of knowledge and abilities for workplace tasks, such as interviewing, facilitating meetings, providing performance appraisals, designing and delivering instructional materials and other professional presentations.

172 **Health Communication** (3) Staff
Exploration of the nature, functions, and impact of relational communication in the context of health care. Both formal (health care organizations) and informal (family communication) systems may be studied. Topics can include provider–patient interaction, media and health, confirmatory communication. Prerequisite: Comm 41 or 100 or permission of instructor.

173 **Communication in a Mediated World** (3) Staff
An exploration of human-to-human communication mediated by computer technology. Traditional communication theories will be applied and adapted to the computer-mediated realm; newer theories of computer-mediated communication are addressed.

174 **Intercultural Communication** (3) Miller
Exploration of the process, trends, rewards, and difficulties of human communication in intercultural contexts, with an eye toward establishing guidelines for mitigating miscommunication across cultures. May involve fieldwork. Prerequisite: Comm 41 or permission of instructor.

176 **Issues and Image Management** (3) Bresnahan
The issues and image management function in corporate, professional, and nonprofit organizations. Assignments may include in-class collaboration on case studies of communication campaigns and crisis communication strategies, interviews with professionals in the practice of communication management, and a communication audit of strategies and messages of a selected organization.

180 **Communication Criticism** (3) Warren, Selby
Evaluation of communication paradigms along critical dimensions of analysis. Prerequisite: Comm 40 or 150 or permission of instructor.

190 **Selected Topics** (3) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

196 **Independent Study** (1 to 3) Staff
Independent research and special projects. Open to seniors or exceptionally well-prepared juniors majoring in communication. Before students are permitted to register, they must submit a written proposal of the plan of study and obtain approval of the faculty member who will direct the study and of the program chair.

197 **Internship** (3) Warren
For communication majors and minors. Student-secured internships in communication-related organizations. Students spend at least 15 hours per week doing communication-related work in a public or private organization. Meetings, reports, and/or analysis paper may be required by supervising instructor. Admission requires prior program approval. Graded on a Pass/No Pass basis.

199 **Senior Seminar** (3) Warren, Selby, Critchfield
Capstone course limited to communication majors. Selected reading and discussion. Each student works on an individually designed research project throughout the term, the results of which will be presented in a major paper. Prerequisite: Comm 100 and 110.

COMPUTER SCIENCE

Professors W.D. Maurer, S.Y. Berkovich, M.B. Feldman, P.S. Bock, J.L. Sibert, R.S. Heller, C.D. Martin (*Chair*), H.-A. Choi, A. Youssef, B. Narahari, S. Muftic (*Research*), J.K. Hahn, N. Howard (*Research*)
Associate Professors S. Rotenstreich, R. Simha, T. Rosenberg (*Research*), A. Bellaachia
Assistant Professors R.W. Lindeman, J. Stanton, X. Cheng, P. Vora, L.D. Florea
Adjunct Professors G.J. Kowalski, D.C. Roberts, S.H. Kaisler
Associate Professorial Lecturers T. Hanson, T. Aleem, A. Draganova, M. Happel, A. Kim, R. Sabett
Assistant Professorial Lecturers R.A. Fernandez, T. Bragg, M. Lancaster

See the School of Engineering and Applied Science for programs of study leading to the Bachelor of Arts and Bachelor of Science with majors in computer science.

Note: With the exception of CSci 41, 53, and 105, CSci courses numbered 110 and below may not normally be counted toward degree requirements for computer science majors.

10 **Applications Software** (3) Heller and Staff
Introduction to the use of microcomputer hardware and software for word processing (e.g., Word), spreadsheets (e.g., Excel), and database management (e.g., Access), with emphasis on the use of computers to solve typical problems in academia and business. (Fall and spring)

30 **Introduction to Computers and the Internet** (3) Martin and Staff
Survey of computers and languages. Introduction to computer programming. History of computing and networking. The effects of computing and the Internet on our lives. E-commerce and new technologies. Concepts of web page design. (Fall and spring)

33 **Introduction to Internet Technology** (3) Heller and Staff
An introductory course for non-technical students who wish to obtain a better understanding of the hardware and software that comprise the Internet. Information transfer over fiber, routing and switching of packets, methods of information transfer, protocols, software, ISP, web pages and multimedia. (Fall and spring)

35 **Introduction to Web Software Development** (3) Martin and Staff
Introduction to the Internet. Topics include address and URL to find your way, linking to a URL, HTML and web programming, building a web page, building a home page, client–server techniques. (Fall and spring)

41 **Introduction to Computer Science** (3) Feldman and Staff
A survey of the disciplines of computer science including history of computing, assembly and high-level programming languages, machine logic and circuits, the Turing machine, artificial intelligence, UNIX operating system, Internet basics, and web page design. (Fall)

49 **Introduction to C Programming** (3) Choi and Staff
Structured programming with the C language. Control structures. Data types. Use of pointers. Matrix manipulation to solve simultaneous equations. External subroutines for mathematical and graphical applications. Introduction to C++. Complex number representation. Corequisite: Math 20 or 31. (Fall and spring)

50 **Introduction to FORTRAN Programming** (3) Bock and Staff
Structured programming with high-level language using FORTRAN. Control structures. Different data types with emphasis on real and complex number computations. Arrays used with vector and matrix manipulation to solve simultaneous equations. External subroutines for mathematical and graphical applications. Prerequisite or corequisite: Math 20 or 31. (Spring)

53 **Introduction to Software Development** (3) Feldman and Staff
Introduction to the solution of problems on a digital computer using the Java language. Object-oriented programming concepts; documentation techniques; design of test data. Writing, debugging, and running programs in an interactive computing environment. Prerequisite or corequisite: CSci 41. (Fall and spring)

100 **Introduction to Programming with C++** (3) Martin and Staff
Intensive introductory course for students with a science, mathematics, or other quantitative background. Solution of numerical and nonnumerical problems on a digital computer using C++ programming language in a Unix environment. Recommended for graduate and advanced undergraduate students in other departments. Prerequisite: Math 32 or equivalent. (Fall and spring)

102 **Introduction to Programming with Java** (3) Narahari and Staff
An introductory course in programming a computer, using the Java language. Object-oriented programming, classes, applets, methods, control structures, inheritance, overriding, widgets and the AWT package, containers, and exceptions. (Fall and spring)

103 **Data Structures and C++** (3) Maurer and Staff
Big-O notation, linked lists, stacks, queues, trees, graphs, searching, sorting, resizeable arrays. Classes in C++, templates, constructors, destructors, exceptions, files, derived classes, operator overloading. May be taken for graduate credit by students in fields other than computer science. Prerequisite: CSci 49 or 100. (Fall and spring)

105 **Introduction to Computer Security and Information Assurance** (3) Vora and Staff
Introduction to key concepts of computer security: risk analysis, basic cryptography, operating system security, network security concepts, database security concepts. Related policy issues such as privacy and intellectual property. May not be taken for credit by computer science majors in the computer security and information assurance option. Prerequisite: CSci 53. (Fall)

110 **Technology and Society** (3) Martin and Staff
Historical, social, and ethical issues of the technological age. Ethical principles and skills and social analysis skills needed to evaluate the design and implementation of complex computer systems. Privacy, computer crime, equity, intellectual property, professional ethics. Data collection, analysis, and presentation; technical writing and oral communication skills. (Fall)

123 **Discrete Structures** (3) Narahari and Staff
Mathematics for computer science. Sets, functions, sequences. Propositional and predicate calculus, formal proofs, mathematical induction. Matrices, semigroups, groups, isomorphism. Relations, partitions, equivalence relations, trees, graphs. May be taken for graduate credit by students in fields other than computer science. Prerequisite: CSci 41 or 49; Math 20 or 31. (Fall and spring)

133 **Software Construction and Data Structures** (3) Feldman and Staff
Object-oriented software. Inheritance, exceptions, development of classes and applets, event-driven programming. Data structures such as trees, lists, stacks, queues, and strings. Sorting and searching. Introduction to algorithm performance prediction. May be taken for graduate credit by students in fields other than computer science. Prerequisite: CSci 53. (Fall and spring)

135 **Computer Architecture I** (3) Cheng and Staff
Computer organization, structure of primary and secondary memory, cache structure, input/output subsystems, digital logic and chips, microprogramming

structures, instruction formats, methods of addressing, and virtual memory. Prerequisite: CSci 123, 133. (Fall)

136 **Computer Architecture II** (3) Cheng and Staff
Assembly and machine language programming, integer and floating-point arithmetic units, design of computer components, design of a simple computer, design of a pipelined computer, design of cache, main memory and virtual memory systems, design of buses, channels and the I/O structure. Prerequisite: CSci 135. (Spring)

143 **Software Engineering I** (3) Simha and Staff
Review of programming techniques and software development in one or more programming languages. Application development with GUIs, database access, threads, Web programming. Prerequisite: CSci 133. (Fall and spring)

144 **Introduction to Bioinformatics** (3) Simha
Broad introduction to the field of bioinformatics. Overview of DNA/RNA, proteins, and the central dogma. Biological databases and searching. The new biology lab. Alignment tools. Protein structure and function. Overview of phylogenetics. May be taken for graduate credit by students in fields other than computer science. Prerequisite: BiSc 14. (Fall and spring)

147 **Team Project Development and Professional Ethics** (3) Martin and Staff
Development of a large software project using a team approach. User interface and interface standards. Integration and testing of modules. Social impact analysis. Professional code of ethics. Intellectual property; computer crime and hackers. Oral presentation and demonstration of the project. Prerequisite or corequisite: CSci 143 or permission of instructor. (Spring)

150 **Foundations of Computing** (3) Youssef and Staff
Ordering, formal grammars, finite-state machines, equivalence of machines, reduction, finite-state languages, acceptors, regular expressions, pushdown automata, context-free languages, Turing machines, computability. Prerequisite: CSci 135, 143. (Fall)

151 **Algorithms and Data Structures II** (3) Narahari and Staff
Advanced data structures (internal and external): hash tables, AVL trees, B-trees. Advanced algorithms: graph searches, shortest path, greedy method, divide and conquer, dynamic programming, backtracking. Introduction to NP-completeness. Prerequisite: CSci 123, 143. (Fall)

156 **Introduction to Operating Systems** (3) Rotenstreich and Staff
Process management, process state, concurrent processing, synchronization, events. Operating system structure, the kernel approach, processor scheduling, task switching, monitors. System management, memory management, process loading, communication with peripherals. File systems. Interactive computation. Prerequisite: CSci 103 or 143. (Fall)

160 **Theory of Computer Translators** (3) Choi and Staff
Lexical and syntax analysis, regular expressions, context-free grammars, parsing techniques, top-down parsing, efficient parsing, syntax-directed translation, intermediate formats, flow of control, block structures, procedure calls, symbol tables, run-time storage, error-detection and recovery, code optimization, code generation. Prerequisite: CSci 136, 150. (Spring)

161 **Software Engineering II** (3) Rotenstreich and Staff
Requirements definition, modularity, structured design, data and functional specifications, verification, documentation. Program design. Software tools, maintenance, project organization, design teams, quality assurance. Prerequisite or corequisite: CSci 151. (Spring)

162 **Cryptography** (3) Vora and Staff
How to safeguard digital possessions. Cryptography from Julius Caesar to public key cryptography. Key management problems and solutions. Cryptographic systems and applications, including IPSec, SSL, PGP, and RSA. Prerequisite: CSci 150, 151. (Spring)

166 **Computational Biology** (3) Simha
Pairwise alignment and scoring. Multiple sequence alignment. Fragment assembly, physical mapping of DNA. Phylogenetic trees. Molecular structure prediction and protein folding. Microarrays and microarray data, image comparison. Clustering. Overview of biological databases, PDB, MMDB, GenBank. Draft genomes and genome browsers. Pathway databases. May be taken for graduate credit. Prerequisites: CSci 144, 151, or 212. (Spring)

169 **Software Paradigms** (3) Feldman and Staff
Comparison of the major paradigms of software design and their embodiment in programming languages. Object-oriented, procedural, scripting, functional, and concurrent software design paradigms and patterns. Prerequisite: CSci 143. (Fall)

171 **Concepts and Applications of Computer Graphics** (3) Hahn and Staff
2-D graphics principles. Principles of digital painting, drawing, and photo-editing. Image manipulation and storage, electronic color representation, and printing. Building 3-D geometry and rendering; 3-D input and output devices and techniques. Prerequisite: CSci 143. (Spring)

172 **Computer Security** (3) Vora and Staff
Risk analysis, cryptography, operating system security, identification and authentication systems, database security. Prerequisite: CSci 156; corequisite: CSci 183. (Fall)

173 **Introduction to Numerical Methods** (3) Youssef and Staff
Numerical methods for solving simultaneous linear equations, roots of equations, eigenvalues and eigenvectors, numerical differentiation and integration, interpolation, solution of ordinary and partial differential equations, and curve fitting. May be taken for graduate credit. Prerequisite: ApSc 113, 115; CSci 133 or equivalent. (Fall)

174 **Introduction to Artificial Intelligence** (3) Bock and Staff
Knowledge representation, search, and reasoning. Structure and function of natural intelligence. Solving complex problems with uncertain knowledge. Biologically inspired paradigms (neural networks, adaptive learning, genetic algorithms). Statistical classification and clustering. May be taken for graduate credit. Prerequisite: CSci 151 or 212; ApSc 115. (Spring)

175 **Information Policy** (3) Martin and Staff
Roles, issues, and impacts of computer-based information systems in national and international arenas, focusing on privacy, equity, freedom of speech, intellectual property, and access to personal and governmental information. Professional responsibilities, ethics, and common and best practices in information use. May be taken for graduate credit. (Fall)

178 **Database Systems I** (3) Narahari and Staff
Design and architecture of relational database systems. Query language, data models, data structures to minimize access time, relational data structures. Construction of a database management system. Prerequisite: CSci 147. (Spring)

180 **UNIX System Programming** (3) Maurer and Staff
Exposure to UNIX internals. Use of UNIX system calls and utilities in conjunction with script and C programs. RFCs, GNU project, and other collaborative traditions in the UNIX community. May be taken for graduate credit. Prerequisite: Senior status or 1 year of C programming and UNIX user experience. (Fall)

181 **Design of Computer Animation I** (3) Hahn and Staff
Use of commercial 3-D computer animation packages to create digital artistic works. Principles of animation, including timing, exaggeration of motion, and anticipation; use of a storyboard; modeling; motion; rendering and editing. Prerequisite: CSci 171. (Fall)

182 **Design of Computer Animation II** (3) Hahn and Staff
Use of commercial 3-D animation packages to create artistic works and visualizations. Process-spanning concepts of development through pre-production, production, and post-production. Emphasis on developing original content and attaining high production values. Prerequisite: CSci 181. (Spring)

183 **Computer Networks I** (3) Heller and Staff
Higher-layer protocols and network applications on the Internet, such as session layer, presentation layer, data encryption, directory services and reliable transfer services, telnet, network management, network measurements, e-mail systems, and error reporting. Prerequisite: CSci 135, 143. (Fall)

184 **Computer Networks II** (3) Stanton and Staff
Computer networks and open system standards. Network configurations and signals, encoding and modulation, transmission media, connection interfaces, error detection and correction, signal compression, switching, link layer control, ISDN, X.25, frame relay, ATM, and Sonet. Bridges, routers, and routing algorithms. Prerequisite: CSci 183. (Spring)

185 **Computer Graphics I** (3) Sibert and Staff
Hardware; concepts of graphics subroutine packages; programming concepts for interaction, display, and data structuring; basic clipping and scan-conversion algorithms; homogeneous coordinates; three-dimensional viewing transforms; basic rendering. May be taken for graduate credit. Prerequisite: CSci 143 or 210. (Spring)

186 **Simulation Methods** (3) Bock and Staff
Computational methods for continuous and discrete system simulation. Effects of computer software and hardware architectures on computational precision and accuracy requirements. Random-number generation and testing. Calibration and scaling technique. Verification and validation technique. Prerequisite: CSci 143. (Spring)

187 **Design of User–Interface Programs** (3) Sibert and Staff
Structure of interactive programs. Widgets, windows, and input devices. Client–server model, event-driven programming, and callbacks. Window systems (e.g., Xwindows) and dialog control. May be taken for graduate credit. Prerequisite: CSci 143 or 210. (Spring)

188 **Software Design for Handheld Devices** (3) Maurer and Staff
Design of interactive software for handheld devices. Event driven programming, user interface design practices, memory management, handheld debugging techniques. May be taken for graduate credit. Prerequisite: CSci 143 or 210. (Spring)

189 **Unix System Administration** (3) Maurer and Staff
System administration for the stand-alone system or small networks. Installation of two or more UNIX variants (Linux, FreeBSD, Solaris) on Intel or Sparc platforms. Configuration of mail, name services, and other network utilities. Backup and recovery, security and ethics. May be taken for graduate credit. Prerequisite: CSci 180. (Spring)

190 **Real-Time Computer Systems** (3) Feldman and Staff
Development of software for real-time control of physical systems. Reliability and fault tolerance, exceptions and exception handling, reliability and concurrent processes, timeouts, deadline scheduling, shared-memory and message-based device drivers. May be taken for graduate credit. Prerequisite: CSci 143. (Spring)

191 **Computer Game Design and Programming** (3) Hahn and Staff
Principles, techniques, and design of computer games. Graphic game engines, modeling, motion, AI and interaction; sound design and synthesis; real-time software and hardware issues. May be taken for graduate credit. Prerequisite: CSci 185. (Fall)

192 **Network Security** (3) Stanton and Staff
Security protocols and applications in local and global networks; IPSec and other communication-level security systems; security in local area networks (Kerberos); authentication and key-exchange protocols; certificates and PKI; secure network applications. Prerequisite: CSci 172. (Spring)

193 **Development of Open-Source Software** (3) Stanton
Design, process, tools, and culture of open-source software development. Cross-platform development and testing. Geographic dispersal, social and team dynamics, licenses (GPL, BSD, other); code reuse (modular code, shared libraries); very-large-scale distributed development techniques (CVS, Bugzilla, release-management, mailing-lists). May be taken for graduate credit. Prerequisite: CSci 143 or 210. (Fall)

194 **Discrete Analysis in Computer Science** (3) Berkovich and Staff
Combinatorial theory: permutations and combinations, generating functions, recurrence relations, the principle of inclusion and exclusion. Block designs. Applications to the analysis of algorithms, computer organization, VLSI placement, coding theory, simulation, and other problems. May be taken for graduate credit. Prerequisite: CSci 123 or permission of instructor. (Fall)

195 **Senior Computer Science Design Project I** (3) Narahari and Staff
Conception, planning, design, and construction of a one-year project. Economic analysis of the product. Use of Gantt charts. Lectures on presentation techniques, project construction, ethics, and professionalism. Five project report presentations, using visual aids. Formal written reports. Start of the construction. Prerequisite: CSci 178; and senior status. (Fall)

196 **Senior Computer Science Design Project II** (3) Narahari and Staff
Completion and demonstration of project started in CSci 195. Formal written reports, demonstrations, and oral presentations, using visual aids, of the progress of the project throughout the semester. Lectures on presentation techniques, ethics, project plans, testing procedures, user's manual, and user interfaces. Prerequisite: CSci 195. (Spring)

197 **Special Topics** (1 to 3) Staff
Topic to be announced in the *Schedule of Classes*. (Fall and spring)

198 **Research** (1 to 3) Staff
Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

COUNSELING/HUMAN AND ORGANIZATIONAL STUDIES

Programs in counseling are offered at the graduate level by the Graduate School of Education and Human Development through its Department of Counseling/Human and Organizational Studies. The following courses are available to undergraduates.

COUNSELING

162 **Professional and Ethical Orientation to Counseling** (3) Staff
The roles and functions of a professional counselor and the ethical standards that govern the profession. (Fall, spring, and summer)

163 **Psychosocial Adjustment** (3) Staff
Mental health problems; emphasis on needs of counselors, teachers, and others working with children and adolescents. (Fall)

175 **Introduction to Rehabilitation Counseling** (3) Staff
Overview of rehabilitation profession, including philosophy, history, ethics, theory, legislation, settings, and practice. (Fall)

178 **Disability Management and Psychosocial Rehabilitation** (3) Staff
Case management services for persons with physical, mental, and emotional disabilities. (Spring)

181 **Medical and Psychosocial Aspects of Disabilities** (3) Staff
Chronic and traumatic disorders with rehabilitation and psychosocial implications. (Fall)

CRIMINAL JUSTICE

See **Sociology**.

DANCE and DRAMA

See **Theatre and Dance**.

DRAMATIC LITERATURE

Committee on Dramatic Literature
N.C. Garner (*Chair*), R.L. Combs, G. Paster, W.A. Pucilowsky

Columbian College of Arts and Sciences offers an interdisciplinary program in dramatic literature leading to the degree of Bachelor of Arts. This major, which combines the strengths of the Departments of English and of Theatre and Dance, is designed to give equal consideration to the two key aspects of theatre—the literary text and the production.

Bachelor of Arts with a major in dramatic literature—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—A 6-credit sequence chosen from Engl 51–52, 61–62, 71–72, 73–74, 91–92; Hmn 1, 2; Honr 15–16.
3. Required courses for the major (42 credit hours):
   (a) Engl 120, 127–28; Engl/TrDa 124; TrDa 145–46.
   (b) 12 credit hours in drama courses or related topics selected from Clas 113; Engl 105, 108, 155, 156, 157, 158, 165, 166; Mus 121; Fren/Span 132.
   (c) 12 credit hours in performance and production courses in the Department of Theatre and Dance, including TrDa 14, 130, 147.

EARLY MODERN EUROPEAN STUDIES

Committee on Early Modern European Studies
L.B. Salamon (*Chair*), I. Azar, I. Creppell, J.G. Harris, J. Heins, P. Jacks, R.E. Kennedy, Jr., M. Norton, L. Peck, D. Wallace, L. Youens

Columbian College of Arts and Sciences offers an interdisciplinary program in early modern European studies. This humanities program is designed to enhance the student's understanding of the history, culture, politics, philosophy, religion, science, literature, and art of the five centuries (1300–1800) during which the Western world began to take on some of its modern dimensions. The program is directed by an interdepartmental committee.

Bachelor of Arts with a major in early modern European studies—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Hmn 2; four semesters of study, or the equivalent, in a modern European language or Latin.
3. Requirements for the major (all courses are to be chosen in consultation with the advisor):
   (a) 6 credits chosen from AH 104, 105; Hist 121, 123; PSc 106; Rel 145.
   (b) 18 credits, consisting of two sets of 9 credits selected from two of the following four groups: Group A—Fren 53, 121, 122, 123; Ger 91, 171, 195; Ital 53, 120, 197; Span 53, 121, 122, 123; Group B—AH 104, 105, 106, 107, 108, 113, 114, 198; Mus 101–2; Group C—Engl 125, 127–28, 130, 131–32, 153, 155, 172; Clas 127; Group D—Hist 102, 121, 122, 123, 125, 141, 148, 151, 153, 154, 193.
   (c) 6 credits chosen from the entire set of courses listed above or from approved departmental Special Topics or Independent Study courses.

Minor in early modern European studies—Requirements: Hmn 2; four semesters of study in a modern European language, or three semesters of Latin, or the equivalent; AH 104 or 105; one course chosen from Hist 121 or 123, PSc 106, or Rel 145; two additional courses chosen from 3(b) above.

EARTH AND ENVIRONMENTAL SCIENCES

Professor G.C. Stephens
Associate Professors R.P. Tollo, C.M. Fedo, J. Hanchar
Assistant Professor H.H. Teng
Associate Professorial Lecturer M.C. McGuirl
Lecturer R.T. Rye

The Program in Earth and Environmental Sciences offers four undergraduate degree programs: the Bachelor of Arts and the Bachelor of Science with a major in geoscience, the Bachelor of Arts with a major in environmental studies, and the Bachelor of Science with a major in environmental science.

For both the Bachelor of Arts and the Bachelor of Science with a major in geoscience, three options are available. The Earth Materials and Processes option provides a strong foundation for students intending to pursue graduate study or employment in geology or applied geological science. The Earth–Water Interactions option provides an appropriately diverse background for pursuing graduate study or employment in water resources. The Earth and Biological Processes option is designed for students who plan to pursue careers involving the interaction of Earth's physical and biological systems.

The Bachelor of Arts with a major in environmental studies integrates formal study in the natural and social sciences but emphasizes the contribution of the social sciences in the environmental decision-making process. The program serves as initial preparation toward analyzing broad-based environmental policy.

The Bachelor of Science with a major in environmental science provides a broad basis in the physical and natural sciences. The program serves as initial preparation toward examining and evaluating processes and problems in the natural environment.

Bachelor of Arts or Bachelor of Science with a major in geoscience—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required introductory courses—EES 1 and 2, or 2 and 5.
3. Required courses in related areas—(a) Chem 11–12; (b) BiSc 13 or equivalent or, with permission of the instructor, a 100-level BiSc course; (c) for the Bachelor of Science only,

Math 20–21 or 31; and for both the Bachelor of Science and Bachelor of Arts, two courses chosen from Geog 2, Phys 1–2, Astr 1–2, Stat 91.

4. Required courses in the major—EES 111, 112, 122, 126, 140, 195, and 6 credits chosen with prior approval of an advisor from one of the options below. Students should check prerequisites when selecting courses to fulfill their chosen option.

Earth Materials and Processes—EES 117, 118, 124, 125, 143, 189; Chem 105; Geog 105, 106, 107, 134.

Earth–Water Interactions—EES 128, 143, 174, 189; Chem 105; Geog 136.

Earth and Biological Processes—EES 125, 128, 151, 159; Chem 151–52, 153–54; BiSc 130, 150, 151, 154, 155, 156, 157, 158, 159, 167, 168, 169.

Bachelor of Arts with a major in environmental studies—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses (21–23 credit hours): 6–8 credits selected from BiSc 13–14, Chem 11–12, EES 1 or 5 and 2, or Phys 1–2; Econ 11–12, plus 6 credits selected from Anth 1–2, Geog 1 and 2, PSc 1 and 2, Psyc 1 and 105 or 106, or Soc 1; Stat 91.
3. Required courses for the major (52 credit hours):
   (a) BiSc 154; Econ 136; EES 191–92, 193; Geog 106 or 132.
   (b) 9 credit hours selected from designated courses in biological sciences, chemistry, and geoscience.
   (c) 24 credit hours selected in no more than two departments from designated courses in anthropology, economics, geography, political science, psychology, and sociology. Up to 6 hours of credit in EES 196–97 (or other approved field experience or internship courses) may be included in this category.

The science and social science courses listed under 3(b) and 3(c) must be taken in not more than a total of three departments.

Bachelor of Science with a major in environmental science—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses (34–37 credit hours): BiSc 13–14; Chem 11–12; EES 1 or 5; Econ 11–12; Geog 2; Math 20–21 or 31; Stat 91.
3. Required courses in the major (46 credit hours):
   (a) BiSc 154; Chem 105; EES 6, 140 or 174, 193; Econ 136; Geog 132.
   (b) 9 credits selected from Econ 101, 157, 158, 161; PSc 104.
   (c) 15 credits selected from BiSc 102, 103, 107, 125, 137, 140, 150 or 151, 155, 156, 157, 158, 167, 168 or 169; Chem 22 and 23, 110 or 111–12, 151–52 and 153–54; EES 105, 111, 122 or 124, 126, 128, 131, 143, 159, 189; Geog 108, 110, 127, 134, 136, 137.

For graduation with Special Honors, a student must have an overall grade-point average of 3.3 plus the recommendation of the Earth and Environmental Sciences Program; must take EES 199 for 2 or more credit hours; and must submit an approved honors thesis or project report.

Minor in geoscience—18 credit hours, including EES 1 and 2, or 2 and 5, plus 111, 122, 126, and one course selected with prior approval of an advisor from courses required for the major in geoscience.

Note: Changes to Earth and Environmental Sciences courses and programs are under development as this Bulletin is prepared for press; please verify information here with the Program.

1 **Physical Geology** (3) Rye, Stephens, Tollo
Lecture, laboratory. An introduction to the principal features of the composition and structure of the earth. Topics include the nature of minerals and rocks, surface and deep earth processes, mineral and energy resources, and plate tectonics. Laboratory fee, $35. Credit will not be given for both EES 1 and 5. (Fall and spring)

2 **Environments of the Past** (3) Rye, Fedo
Lecture, laboratory. An introduction to the history of the earth. Topics include sedimentary environments, plate tectonics, origin of life, and evolution. Laboratory fee, $35. Prerequisite: EES 1 or 5. (Fall and spring)

5 **Environmental Geology** (3) Lewis, Hanchar, Teng
Lecture, laboratory. An introduction to the impact of geology on the environment, with emphasis on the relation of people and society to natural environ-

ments; population evolution, natural hazards, and mineral resources. Laboratory fee, $35. Credit will not be given for both EES 1 and 5. (Fall and spring)

6 **Science and the Environment** (3) Teng
The large-scale processes operating within the atmosphere, oceans, and solid Earth. Prerequisite: EES 1 or 5. (Spring)

105 **Geological Hazards in Land-Use Planning** (3) Staff
Lecture and laboratory. An analysis of geological hazards and related factors that affect land-use planning. Field trip. Prerequisite: EES 1 or 5 or permission of instructor. Laboratory fee, $30. (Spring)

111 **Mineralogy** (4) Tollo
Lecture and laboratory. Introduction to the crystallography and chemical systematics of rock-forming and exotic minerals. Exercises emphasize the analysis of mineralogic data and the paragenesis of mineral assemblages. Prerequisite: EES 1 or 5 or permission of instructor. Laboratory fee, $30. (Fall)

112 **Optical Mineralogy** (4) Tollo
Lecture and laboratory. Introduction to basic light theory and the identification and characterization of minerals through optical properties. Laboratory exercises provide an introduction to petrologic analysis of igneous and metamorphic mineral systems. Prerequisite: EES 111 or permission of the instructor. Laboratory fee, $30. (Spring)

117 **Petrology** (2) Staff
Introduction to silicate phase systems; physics and chemistry of crustal and magmatic processes; volcanic processes and products. Prerequisite: EES 111, 112; or permission of instructor. (Fall)

118 **Petrology Laboratory** (2) Staff
Concurrent registration in EES 117 required for geoscience majors. Prerequisite: EES 111 and 112. Laboratory fee, $35. (Fall)

122 **Structural Geology** (3) Stephens
Lecture and laboratory. Study of natural and experimental rock deformation and the relationships between stress and strain as recorded by geologic structures. Prerequisite: EES 1 or 5. Laboratory fee, $25. (Fall)

124 **Digital Mapping for the Natural Sciences** (3) Stephens
Principles of surveying, GPS, data structuring, and GIS compilation. Field and laboratory exercises. Laboratory fee, $30. (Spring, odd years)

125 **Marine Geology** (3) Kravitz
Lecture and map work. Principles of oceanography and submarine geology; topography, crustal structure, sedimentary processes, and marine environment. Prerequisite: EES 1 or 5 or permission of instructor. (Spring)

126 **Sedimentology and Stratigraphy** (4) Fedo
Introduction to sedimentation and stratigraphy; origin and classification of sediments and sedimentary rocks; introduction to clastic and carbonate depositional environments and stratigraphic principles. Prerequisite: Chem 11; EES 2, 111. (Fall)

128 **Geomorphology** (4) Stephens
Lecture (2 hours), laboratory (2 hours). Understanding the nature, origin, and development of landforms in the field and through the use of maps and aerial photos. Prerequisite: EES 1 or 5. Laboratory fee, $30. Same as Geog 128. (Spring, even years)

131 **Global Climate Change** (3) Staff
Fundamental causes and patterns of climate change. Methods of reconstruction of past climates; modeling and predicting climate change. (Spring)

140 **Introduction to Geochemistry** (3) Hanchar
Chemical systems and processes on the planet Earth; origins and interactions among and within the Earth's lithosphere, oceans, and atmosphere; origin, distribution, and behavior of the elements; radioactive and stable isotope systems. Prerequisite: Chem 11–12 or equivalent.

143 **Aqueous Geochemistry** (3) Teng
Application of chemical principles to the study of natural waters. Impact of natural and anthropomorphic factors on quality and chemistry. Prerequisite: EES 140, Chem 11–12, or equivalent.

150 **Dinosaurs: Evolution and Natural History** (3) Staff
An introductory course on the natural history of dinosaurs—their evolution, biology, and ecology, their false portrayal in the press, and how scientists study them. (Summer)

151 **Invertebrate Paleontology** (3) Staff
Lecture and laboratory. Review of major invertebrate fossil groups. Uses of fossils in studies of macroevolution, paleoecology, biostratigraphy, tectonics, and climatology. Field trips as arranged. Prerequisite: EES 1 and 2 or 2 and 5 or permission of instructor. Laboratory fee, $30. (Fall)

154 **Vertebrate Paleontology** (3) Staff
Lecture (2 hours), laboratory or field work as arranged. General features of vertebrate morphology and evolution; problems of paleoecology and adaptation. (Fall, odd years)

159 **Geobotanical Ecology of the Central Appalachians** (4) Tollo, Wells
A multidisciplinary approach to Appalachian ecology involving application of scientific principles from both geology and botany, stressing interrelationships between geological, geochemical, and biological processes. Biweekly field trips. Prerequisite: EES 1 or 5 and BiSc 13–14; or equivalent with permission of instructor. Same as BiSc 159. (Spring, odd years)

174 **Introduction to Hydrogeology** (3) Hanchar
Occurrence, storage, movement, quality, pollution, and the hydrologic properties of subsurface water. Prerequisite: EES 1 or 5.

189 **Environmental Geophysics** (3) Stephens
Principles of magnetic, gravity, seismic and electrical methods applied to geological problem-solving. Prerequisite: EES 122 or permission of instructor. (Spring)

191–92 **Senior Seminar in Environmental Studies** (3–3) Merchant
Directed reading and discussion of contemporary environmental problems. Limited to majors in environmental studies or environmental science or with permission of instructor.

193 **Introduction to Environmental Law** (3) McGuirl
An introduction to selected pieces of major environmental legislation. The role of the courts and bureaucracy in implementing and interpreting legislation. Impact on decision making. (Fall)

195 **Geological Field Methods** (3) Tollo
Weekend field trips. Methods of outcrop analysis, geologic mapping, and data interpretation. The geological evolution of the central Appalachian mountains is emphasized. Laboratory fee (field trip fee), $30. (Spring)

196–97 **Field Experience** (3–3) Staff
Open to juniors and seniors majoring in environmental studies and environmental science. Students spend at least eight hours per week in a political, technical, legal, or special-interest organization working on environmental questions.

199 **Undergraduate Research or Reading** (arr.) Staff
Problems approved by the staff. May be repeated once for credit.

EAST ASIAN LANGUAGES AND LITERATURES

Professors J. Chaves, Y.-K. Kim-Renaud (*Chair*)
Associate Professors D.L. Lee, G.C.Y. Wang, S. Hamano
Assistant Professors I.L. Hanami, P.N. Zhang
Adjunct Assistant Professor M. Frost
Lecturers H.V. Pham, M. Sato

Bachelor of Arts with a major in Chinese language and literature—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Chin 5–6 (preferred); or Chin 1–2, 3–4.
3. Required for the major—Chin 11–12, 107–8, 109–10, and 6 hours selected from Chin 161, 163–64; plus 12 additional credit hours of 100-level Chinese courses.

Bachelor of Arts with a major in Japanese language and literature—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Japn 1–2, 3–4; or equivalent.
3. Required for the major—Japn 7–8, 111–12, 199; 15 hours selected from Japn 107–8, 109–10, 162, 185–86; 9 hours in related courses outside the program, as approved by the program advisor.

Minor in Chinese language and literature—Prerequisite: 18–22 credit hours, including *either* Chin 1–2, 3–4, and 11 *or* Chin 5–6 and 11. The minor consists of 12 additional credit hours selected from Chin 12, 107–8, 109–10, 123–24, 136, 161, 163–64, and 179–80.

Minor in Japanese language and literature—Prerequisite: Japn 1–2, 3–4; or equivalent. The minor consists of Japn 7–8 and 12 additional credit hours selected from Japn 107–8, 109–10, 111–12, 162, 185–86, and 199.

Minor in Korean language and literature—Prerequisite: Kor 1–2, 3–4; or equivalent. The minor consists of Kor 7–8 and 12 credits from 107–8, 111–12, and 162.

CHINESE

1–2 **Basic Chinese** (4–4) Zhang
Fundamentals of grammar and pronunciation, with graded reading and practice in writing. Laboratory fee, $50 per semester. (Academic year)

3–4 **Basic Chinese** (4–4) Wang
Continuation of grammar, with emphasis on speaking, reading, and writing. Laboratory fee, $50 per semester. (Academic year)

5–6 **Intensive Basic Chinese** (8–8) Zhang
Intensive beginner's course in fundamentals of grammar and pronunciation, with graded reading and practice in writing. Laboratory fee, $70 per semester. (Academic year)

10 **Chinese Calligraphy** (1) Staff
Writing of Chinese characters with traditional writing implements. No knowledge of the language required. May be repeated for credit. (Fall and spring)

11–12 **Intensive Intermediate Chinese** (6–6) Wang
Reading of basic texts, writing of short pieces, conversation, systematic review of grammar. Prerequisite to Chin 11: Chin 4 or 6. Laboratory fee, $70 per semester. (Academic year)

22 **Intermediate Chinese Conversation** (3) Staff
A practical course for improving speaking ability. Prerequisite: 6 credit hours of Chinese or equivalent. May be repeated for credit. Laboratory fee, $50. (Fall and spring)

107–8 **Readings in Modern Chinese** (3–3) Lee
Readings in selected modern literary works, social science materials, and documentary materials. Prerequisite: Chin 12 or equivalent. (Academic year)

109–10 **Introduction to Classical Chinese** (3–3) Chaves
Introduction to classical writings in Chinese literature, history, and philosophy. Prerequisite: Chin 6. (Alternate academic years)

123–24 **Introduction to Chinese Linguistics** (3–3) Lee
Introduction to the history of the Chinese language. Analysis of linguistic structure of modern spoken Chinese and classical Chinese. Lectures and discussion in English. Prerequisite: Chin 6 or equivalent. (Alternate academic years)

136 **Chinese Women in Myth, Literature, and Film** (3) Frost
Women's position in Chinese cultural and political life from prehistoric myth to the present time. Confucian writing, traditional theatre, and films and novels set in China. A general survey of Chinese history establishes the context for discussions of cultural and political phenomena, such as foot binding and the one-child policy. Same as WStu 136.

161 **Chinese Culture Through Film** (3) Frost
Survey of the Chinese cultural heritage presented through films. Topics include literature, philosophy, art, religion, and social history from prehistorical times to the modern era. Lectures and discussion in English. (Fall and spring)

163–64 **Chinese Literature in Translation** (3–3) Chaves
An introductory course focusing on major works of poetry, drama, and the novel in their historical and social context. (Academic year)

171–72 **Poetry of the Tang and Song Periods** (3–3) Chaves
Reading of works of leading poets. Discussion of content and style. Prerequisite: Chin 109 or equivalent. (Alternate academic years)

179–80 **20th-Century Chinese Literature** (3–3) Lee
Works of Lu Xun, Lao She, and others. Drama of Tian Han and Cao Yu. Prerequisite: Chin 107 or equivalent. (Alternate academic years)

185–86 **Directed Reading** (3–3) Lee
Reading of material in the student's field of interest. Admission by permission of instructor. (Academic year)

188 **Confucian Religion** (3) Staff
Same as Rel 188.

199 **Proseminar: Readings for the Major in Chinese Language and Literature** (3) Staff
Admission by permission of instructor. May be repeated for credit.

JAPANESE

1–2 **Basic Japanese** (4–4) Hamano and Staff
Fundamentals of grammar and pronunciation, with graded reading and practice in writing. Laboratory fee, $50 per semester. (Academic year)

3–4 **Basic Japanese** (4–4) Hamano and Staff
Continuation of grammar, with emphasis on speaking, reading, and writing. Laboratory fee, $50 per semester. (Academic year)

7–8 **Intermediate Japanese** (3–3) Hamano, Hanami
Continuation of reading of basic texts, writing of short pieces, conversation, systematic review of grammar. Laboratory fee, $50 per semester. (Academic year)

107–8 **Readings in Modern Japanese** (3–3) Hamano, Hanami
Readings in selected modern literary works, social science materials, and documentary materials. Prerequisite: Japn 8 or equivalent. (Academic year)

109 **Introduction to Bungo, Literary Japanese** (3) Hanami
Introduction to Bungo, the literary Japanese used in official government documents up to World War II, newspapers and journals through the Meiji period, and literature from the prose of the Tales of Ise to the poetry of Tawara Machi. Prerequisite: Japn 8. (Fall)

110 **Readings in Classical Japanese** (3) Hanami
Readings in premodern texts in Japanese literature, history, and philosophy. Prerequisite: Japn 109. (Spring)

111–12 **Japanese Literature in Translation** (3–3) Chaves, Hanami
An introductory survey of traditional and modern Japanese literature read in English translation: love and nature poetry; theater (classical drama, puppet plays); fiction; diaries. (Academic year)

162 **Japanese Culture Through Film** (3) Hanami
Survey of the Japanese cultural heritage presented through films. Topics include literature, philosophy, art, religion, and social history from prehistorical times to the modern era. Lectures and discussion in English. (Spring)

185–86 **Directed Reading** (3–3) Hanami and Staff
Reading of material in the student's field of interest. Admission by permission of instructor. (Academic year)

199 **Proseminar: Readings for the Major in Japanese Language and Literature** (3) Staff
Admission by permission of instructor. May be repeated for credit.

KOREAN

1–2 **Basic Korean** (4–4) Kim-Renaud
Fundamentals of grammar and pronunciation, with graded speaking, reading, and writing practice. Laboratory fee, $50 per semester. (Academic year)

3–4 **Basic Korean** (4–4) Kim-Renaud
Continuation of grammar, with emphasis on speaking, reading, and writing. Laboratory fee, $50 per semester. (Academic year)

7–8 **Intermediate Korean** (3–3) Kim-Renaud
Reading of basic texts, writing of short pieces, conversation, systematic review of grammar. Laboratory fee, $50 per semester. (Academic year)

107–8 **Readings in Modern Korean** (3–3) Kim-Renaud
Readings in selected modern literary works, social science materials, and documentary materials. Prerequisite: Kor 8 or equivalent. (Academic year)

111–12 **Korean Literature in Translation** (3–3) Kim-Renaud
An introductory survey of Korean literature read in English translation. Kor 111: traditional poetry, fiction, storytelling, drama, diaries. Kor 112: modern fiction, drama, poetry, essays. (Academic year)

162 **Korean Culture Through Film** (3) Kim-Renaud
The intersection of gender, class, and nation in contemporary society through the lens of Korean film. English subtitles; lectures and discussion in English. (Spring)

VIETNAMESE

1–2 **Basic Vietnamese** (4–4) Staff
Fundamentals of grammar and pronunciation, with an introduction to reading and writing. (Academic year)

3–4 **Basic Vietnamese** (4–4) Staff
Continuation of grammar, with emphasis on speaking, reading, and writing. (Academic year)

ECONOMICS

Professors J.L. Gastwirth, R.M. Dunn, Jr., R.S. Goldfarb, A.M. Yezer, J.J. Cordes, J. Pelzman, R.P. Trost, B.L. Boulier, H.S. Watson, M.D. Bradley, S.C. Smith, A. Klamer (*Research*), P. Labadie, G.L. Kaminsky, D.O. Parsons (*Chair*), R.F. Phillips, C.M. Snyder, D. Ribar, M.O. Moore, N. Vonortas
Associate Professors A.S. Malik, F.L. Joutz, S.M. Suranovic, S. Joshi, W.P. Mullin
Assistant Professors V. Fon, J. Soares, D.M. Stryk, R.M. Samaniego, M. Cipriani, M.C. Long, C. Wei
Instructor S. Emran
Adjunct Professors J. Hardt, E.H. Solomon, S.N. Kirby
Professorial Lecturers R.S. Belous, D. Fixler, H. Hertzfeld, J. Kilpatrick, H. Stekler, F.D. Weiss
Associate Professorial Lecturer L. Clauser
Assistant Professorial Lecturers S.E. Baldwin, N. Pham, D. Trybula, J. Vega

Bachelor of Arts with a major in economics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Econ 11–12.
3. Required courses in related areas—Math 21, 31, or 52; Stat 111 and 112, or equivalent; 6 credit hours of a social science other than economics.
4. Required courses in the major—Econ 101, 102, 121, 198, and five additional 100-level economics courses to be approved by the departmental advisor. A maximum of three regional courses (Econ 133, 169, 170, 185) can be counted toward the five additional courses.

Bachelor of Science with a major in economics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Econ 11–12.
3. Required courses in related areas—Math 31 and 32, or equivalent; Stat 111 and 112, or equivalent; 6 hours of additional course work in mathematics, statistics, systems engineering, or computer science, to be approved by the departmental advisor (e.g., Math 33, 124, 125, 142; Stat 157, 158, 181, 183; EMSE 101, 102, 154, 173; CSci 123, 173, 174, 194).
4. Required courses in the major—Econ 101, 102, 121, 123, 198, and four additional 100-level economics courses to be approved by the departmental advisor. A maximum of three regional courses (Econ 133, 169, 170, 185) can be counted toward the four additional courses.

Five-Year Bachelor of Science with a major in economics and Master of Arts in the field of economics—Students interested in this dual degree program should consult the undergraduate program advisor in the Economics Department by the second semester of the sophomore year.

Five-Year Bachelor of Arts or Bachelor of Science with a major in economics and Master of Public Policy—Students interested in this dual degree program should consult the director of the Public Policy Program by the second semester of their sophomore year.

Special Honors—Students may apply for graduation with Special Honors. To be eligible, a student must meet the requirements for Special Honors stated under University Regulations, must have a grade-point average of at least 3.5 in economics courses, and

must submit an honors paper to the department. Upon review of the honors paper, the student may be recommended for graduation with Special Honors.

Minor in economics—(a) 18 credit hours in economics, including Econ 11–12, 101, 102, 121, and one other approved 100-level course in economics; (b) one of the following: 6 credit hours of an approved statistics sequence, such as Stat 111, 112; or 6 hours of an approved mathematics sequence, such as Math 31, 32; or one approved statistics course, such as Stat 111, and one approved mathematics course, such as Math 31 or 52; or one approved mathematics course or one approved statistics course and one additional 100-level course in economics (other than Econ 133, 134, 169, 170, 171, or 185). Stat 129 cannot be used to satisfy the requirements of the minor.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Departmental prerequisite: Econ 11–12 is prerequisite to all other courses offered by the Department of Economics.

11–12 **Principles of Economics** (3–3) Bradley, Dunn, Goldfarb, Trost, Samaniego, Yezer
Major economic principles, institutions, and problems in contemporary life. Econ 11: Microeconomics—supply and demand, the price system and how it works, competitive and monopolistic markets. Econ 12: Macroeconomics—national income concepts, unemployment and inflation, institutions of monetary control. Econ 11 is prerequisite to Econ 12. (Econ 11 and 12—fall and spring)

101 **Intermediate Microeconomic Theory** (3) Fon, Goldfarb, Joshi, Malik, Parsons, Phillips, Snyder, Watson
Analysis of household economic behavior, including derivation of demand functions. Analysis of firm behavior, including derivation of supply frameworks. Demand and supply interaction under various market structures and in factor markets. (Fall and spring)

102 **Intermediate Macroeconomic Theory** (3) Bradley, Joutz, Soares, Wei
Investigation of the determinants of national income, inflation, unemployment, and interest rates. Alternative business cycle theories, with emphasis on the role of imperfect information, uncertainty, and expectations. (Fall and spring)

104 **History of Economic Thought** (3) Staff
History of the major schools of economic thought, influence of changing problems on the development of economic theory. Prerequisite: Econ 101, 102.

105 **Economic Conditions Analysis and Forecasting** (3) Staff
Theory and empirical analyses of economic trends and fluctuations; use of economic indicators and simple econometric models. (Fall)

121 **Money and Banking** (3) Joutz, Labadie, Samaniego, Wei
The role of money, credit, interest rates, foreign exchange rates, and commercial banks and other financial institutions in the U.S. economy. (Fall and spring)

122 **Monetary Theory and Policy** (3) Solomon
Analysis of classic and modern monetary theories and their application to current economic conditions. The links between theory and policy. The altered role of money over time; the new money technology. (Spring)

123 **Introduction to Econometrics** (3) Trost, Phillips, Ribar
Joint offering of the Economics and Statistics Departments. Construction and testing of economic models: regression theory, parameter estimation, and statistical techniques applicable to economic models. Prerequisite: Math 31; Stat 112. (Fall and spring)

133 **Economies of the Former Soviet Union and Eastern Europe** (3) Staff
Analysis of the transition process in the former Soviet Union and Eastern Europe. Topics include economic models of planned economies and comparative analysis of economic development programs of the newly independent states and Eastern Europe. (Fall)

136 **Natural Resources and Environmental Economics** (3) Malik
Analysis of market mechanisms that allocate energy and natural and environmental resources; investigation of actual and optimal resource allocation across uses and time; review of arguments for public intervention. (Spring)

142 **Labor Economics** (3) Ribar, Parsons
Analysis of labor supply and demand; measurement and theory of unemployment; occupational choice; wage differentials; labor market issues and policies. (Fall)

148 **Health Economics** (3) Staff
Economic analysis of the determinants of demand, supply, output, and distribution in the health care sector, with special emphasis on current policy issues of access, quality, and cost. (Spring)

151 **Economic Development** (3) Smith, Emran
Theories and empirical studies of the economic problems of developing countries. (Fall and spring)

153 **Income Distribution** (3) Staff
An analysis of the distribution of income, with focus on issues relating to wealth and poverty. (Spring)

157 **Urban and Regional Economics** (3) Yezer
Analysis of the determinants of urban growth and development; firm location; the functioning of urban land and housing markets.

158 **Industrial Organization** (3) Snyder, Mullin
Analysis of market structure, conduct, and performance of firms in a market economy, with emphasis on case studies of U.S. industries. (Fall)

159 **Government Regulation of the Economy** (3) Snyder, Mullin
Economic analysis of antitrust and regulation in the American economy. Prerequisite: Econ 101 or 158. (Spring)

160 **Survey of Finance and Engineering Economics** (3)
Same as EMSE 160.

161 **Public Finance: Expenditure Programs** (3) Cordes, Watson
Economic analysis of government spending and social regulation programs. Topics include public goods, externalities, income transfer and social insurance programs, and benefit–cost analysis of government programs. (Fall)

162 **Public Finance: Taxation** (3) Cordes, Watson
Economic analysis of taxes and government deficits. Topics include individual and corporate income taxes, payroll taxes, sales and excise taxes, property and wealth taxes, design of tax systems, and effects of taxation on labor and capital markets. (Spring)

165 **Economics of Human Resources** (3) Boulier
Economic analysis of education and training, labor market discrimination, marriage and the family, and social security. (Fall)

167 **Economics of Crime** (3) Yezer
Analysis of crime, both empirical and theoretical, that examines the links between law and economics, the economics of criminal participation, and the economics of law enforcement. (Spring)

169 **Introduction to the Economy of China** (3) Staff
Background, organization, and operation of the economy. Appraisal of performance and analysis of problems of development. (Fall)

170 **Introduction to the Economy of Japan** (3) Staff
Analysis of the structure and growth of the Japanese economy. (Spring)

181–82 **International Economics** (3–3) Dunn, Moore, Suranovic, Pelzman, Cipriani
Econ 181: International trade theory and policy. Econ 182: International macroeconomic theory and policy. (Academic year)

185 **Economic History and Problems of Latin America** (3) Staff
Analysis of present structures and problems of Latin American economies.

190 **Law and Economics** (3) Snyder, Pelzman, Fon
An introduction to the economic analysis of legal systems. How laws alter behavior and how laws might be designed to satisfy efficiency and fairness criteria. Prerequisite: Econ 101.

195 **Special Topics** (3) Staff
Topics vary, depending on current issues of interest and faculty availability.

198 **Proseminar** (3) Boulier, Bradley, Fon, Goldfarb, Parsons, Suranovic, Watson
Preparation and presentation of a research paper in any field of economics agreed upon by student and instructor. Review of selected topics in contemporary economics. Open only to economics majors in their senior year.

199 **Independent Research** (3) Staff
Prerequisite: Completion of 12 hours of 100-level economics courses, including Econ 101 and 102, with a minimum grade-point average of 3.4; and approval

of an independent research project by a faculty member of the Economics Department.

EDUCATIONAL LEADERSHIP

Programs in educational leadership are offered at the graduate level by the Graduate School of Education and Human Development. The following courses are open to undergraduates.

104 **Psychology for Learning and Teaching** (3) Staff
Principles, theory, nature, and course of learning and teaching processes. Examination and analysis of the strategies and dynamics of teaching and learning in behavioral settings. Thirty hours of fieldwork in an educational setting. (Fall and spring)

125 **Museums as Cultural and Educational Resources** (3) Staff
A general introduction to museums as institutions, sources of information, and places for enjoyment. Classes take place on campus and at museums in the metropolitan area. Admission by permission of instructor. (Spring)

180 **Computer Literacy** (3) Staff
Word-processing, desktop publishing, graphics, database management, spreadsheets, charting, and communications software are introduced through reading, demonstrations, and hands-on activities in a computer classroom. Use of the Internet and the web. No previous computer experience required. (Fall, spring, and summer)

ELECTRICAL AND COMPUTER ENGINEERING

Professors W.K. Kahn, H.J. Helgert, R.H. Lang, N. Kyriakopoulos, T.N. Lee, E. Della Torre, R.J. Harrington, W. Wasylkiwskyj, N.A. Alexandridis, M.H. Loew, R.L. Carroll, Jr., M.E. Zaghloul, M. Pardavi-Horvath, B.R. Vojcic (*Chair*), H. Szu (*Research*), D. Nagel (*Research*), J.N. Pelton (*Research*), K.B. Eom, C.E. Korman, T. El-Ghazawi, L. Bennett (*Research*)
Associate Professors D. Saha, M. Doroslovacki, Z. Guo, S. Subramaniam
Assistant Professors J.M. Zara, S. Ahmadi (*Research*), E. Larsson
Adjunct Professors A. Schneider, W.D. Jackson, D.M. Le Vine
Associate Professorial Lecturer M.R. Berman

See the School of Engineering and Applied Science for programs of study leading to the Bachelor of Science with majors in electrical engineering, computer engineering, and biomedical engineering.

1–2 **Introduction to Electrical, Computer, and Biomedical Engineering** (1–1) Korman and Staff
Basic and emerging concepts in electrical, computer, and biomedical engineering. Hands-on experiments and projects. Introduction to the professional literature and available resources and to technical writing, speaking, and presentation skills. (Academic year)

11 **Circuit Theory** (4) Zaghloul and Staff
Lecture (3 hours), laboratory (3 hours). Circuit elements, techniques of circuit analysis; circuit theorems; operational amplifiers; RLC circuits; natural and step responses; series, parallel and resonant circuits; sinusoidal steady-state analysis; phasers; power calculations; transformers; two-port circuits. CAD tools used in circuit projects. Corequisite: ApSc 113, Phys 22. (Fall and spring)

12 **Circuits, Signals, and Systems** (3) Kyriakopoulos and Staff
Circuit analysis using Laplace transforms; transfer functions; poles and zeroes; Bode diagrams; effects of feedback on circuits; convolution; Fourier series and Fourier transforms; design of filters; CAD tools used in design of projects. Prerequisite: ECE 117; corequisite: ApSc 114. (Fall and spring)

20 **Engineering Electronics** (4) Korman and Staff
Lecture (3 hours), laboratory (3 hours). Solid-state devices used in electronic engineering. Physics of their operation. Application to electronic circuits. Primary emphasis on application of these elements in power supplies and in linear amplifiers. Design concepts through use of SPICE and graphical techniques. Prerequisite: ECE 11. (Fall and spring)

30 **Introduction to Electromagnetics** (3) Lang and Staff
Maxwell's equations, pulse propagation in one dimension, transmission line equations, reflection coefficient, capacitance and inductance calculations, Smith chart, plane waves, reflection from a dielectric of fiber and integrated optics. Prerequisite: ApSc 113, Phys 22. (Spring)

31 **Fields and Waves I** (3) Kahn and Staff
Complex phasor notation, uniform transmission lines, standing wave ratio, power, reflection coefficient, impedance matching. Review of vector analysis and numerical methods. Electrostatics, generalizations of Coulomb's law, Gauss's law, potential, conductors, dielectrics, capacitance, energy. Prerequisite: ApSc 113; Phys 22. (Spring)

32 **Fields and Waves II** (3) Kahn and Staff
Magneto-stationary fields, Lorentz force torques, Biot–Savart law, Ampere's law, magnetic materials, inductance, energy. Maxwell's equations, Faraday's law, charge–current continuity, vector potential. Time-harmonic fields, plane waves, polarization, skin effect, dielectric boundaries, and fiber optics. Radiation, dipole, gain, effective area. Prerequisite: ApSc 114, ECE 31. (Fall)

114 **Analog Signals and Systems** (3) Lee and Staff
Applications of matrix theory and linear graphs to electrical network analysis; network equations; state–space formulation and solution, Fourier transforms and spectra in electrical systems. Network functions; analysis and synthesis of analog filters, the approximation problem; realization of filters. Prerequisite: ECE 12, 20. (Fall)

117 **Introduction to Digital Signal Processing** (3) Kyriakopoulos, Doroslovacki, and Staff
Signal representation, sampling and quantization, discrete-time signals, z-transforms and spectra, difference equations. Fourier analysis. Discrete Fourier transform, IIR and FIR filter design. Prerequisite: ECE 11. (Spring)

121 **Analog Electronics Design** (4) Korman and Staff
Lecture (3 hours), laboratory (3 hours). Design, testing, and measurement of analog electronic circuits. Differential and multistage amplifiers. Output stages and power amplifiers. Frequency response of amplifiers, high-frequency models of FETs and BJTs. Introduction to feedback circuit topologies. Use of electronic CAD tools, such as P-SPICE. Prerequisite: ECE 20. (Spring)

122 **Digital Electronics and Design** (4) Korman and Staff
Lecture (3 hours), laboratory (3 hours). Design and testing of logic gates, regenerative logic circuits, and semiconductor memory circuits. Implementation of such circuits with NMOS, CMOS, TTL, and other integrated circuit technologies. Use of electronic CAD tools, such as P-SPICE. Prerequisite: ECE 20, 140. (Fall)

126 **VLSI Design and Simulation** (3) Zaghloul and Staff
Design of VLSI circuits. Stick diagramming, NMOS transistors, switch and gate logic, PLAs, finite-state machines, design rules, CAD system, speed and power considerations, floor planning, layout techniques. The student will design a VLSI circuit and simulate the design. May be taken for graduate credit. Prerequisite: ECE 122, 162. (Fall)

127 **VLSI Fabrication Techniques** (3) Zaghloul and Staff
Choice of circuit technologies, process technologies associated with various types of components. Fabrication of VLSI, two basic MOS technologies and other available technologies, oxidation, photoengraving, chemical etching, diffusion. May be taken for graduate credit. Prerequisite: ECE 122, 140. (Spring)

128 **Design and Testing of VLSI Circuits** (3) Zaghloul and Staff
ASIC design methodology, use of ASIC design CAD tools. Introduction to logic synthesis, styles of synthesis, power/area/speed constraints. Introduction to VLSI testing, fault models, design for testability techniques, scan path, JTAG, and built-in self-test. Students must test the chips previously designed in ECE 126. May be taken for graduate credit. Prerequisite: ECE 126. (Spring)

134 **Fiber Optical Communication** (3) Pardavi-Horvath and Staff
Lightwave fundamentals. Integrated optics. Optical fiber waveguides. Light sources and detectors. Distribution networks and fiber components. Modulation. Noise and detection. System design. Prerequisite: ApSc 114; ECE 30 or 32. (Fall, odd years)

140 **Design of Logic Systems I** (4) Zaghloul and Staff
Lecture (3 hours), laboratory (3 hours). Boolean algebra; combinational and sequential circuits; minimization techniques; design-and-build logic subsystems, such as decoders, multiplexers, adders, and multipliers; use of CAD tools. Corequisite: ECE 20. (Spring)

141 **Microprocessors: Software, Hardware, and Interfacing** (3) Guo and Staff
Microprocessor architecture, assembly language, address decoding, hardware interrupt, parallel and serial interfacing with various circuits, timer/counters, direct memory access, microprocessor-based system. Hands-on laboratory experience is an integral part of this course. Prerequisite: ECE 140. (Fall)

143 **Communications Engineering** (3) Doroslovacki and Staff
Fourier series and Fourier transform in relation to signal analysis. Convolution and linear filtering. Signal bandwidth and sampling theorem. Analog modulation. Random variables and stochastic processes; power spectrum. Digital modulation: BPSK, QPSK, MSK. Pulse code modulation, DPCM and delta modulation. Prerequisite: ApSc 115, ECE 12. (Spring)

144 **Introduction to Computer Networks** (3) Doroslovacki and Staff
Types of networks. Circuit and packet switching. Layered network architectures. Electrical interfaces. Parity checking and CRC error detection codes. Automatic-repeat-request protocols. Routing. Flow and congestion control. Multiple-access protocols. LAN standards. Internetworking and transport layer protocol—TCP/IP. ISDN, SONET, and ATM. Prerequisite: ApSc 115. (Spring)

146 **Communications Laboratory** (1) Doroslovacki and Staff
Experiments supporting communications systems. Fourier analysis and Fourier transform. Sampling theorem, filtering, and aliasing. Amplitude modulation (AM), frequency modulation (FM), quantization, and pulse code modulation (PCM). Delta modulation. Binary phase shift keying (BPSK). Quadrature phase shift keying (PSK). Corequisite: ECE 143. (Spring)

147 **Data Communications Laboratory** (1) Doroslovacki and Staff
Experiments in support of the analysis and design of communications systems with emphasis on network protocols. Time and frequency division multiplexing, flow control, automatic repeat request, interfacing, token ring, token bus, multiple access for Ethernet, routing, packet switching. Prerequisite or corequisite: ECE 144. (Spring)

148 **Simulation of Communications Systems** (3) Vojcic
Representation and simulation of deterministic and random signals and systems. Modeling of communication systems; performance measures and statistical methods for the interpretation of simulation results. Simulation techniques and technology in communications. Case studies. Corequisite: ECE 144 or equivalent. May be taken for graduate credit. (Spring)

150 **Introduction to Telemedicine** (3) Loew
Clinical applications; data dimensionality, acquisition, and conversion; transmission methods (wired, wireless); networking; compression; measurement of quality and accuracy; reception and display considerations; data archiving and retrieval; economic issues; user-interface considerations. Prerequisite: ECE 117, ApSc 115. (Fall)

151 **Signal and Image Analysis** (3) Loew
Introduction and clinical applications; characteristics of biomedical problems, time- and frequency-domain techniques for signal feature analysis; spectral estimation and analysis; autoregressive modeling; detection and estimation of periodicity; digital images as two-dimensional signals; 2-D Fourier transform. Prerequisite: ECE 12, ApSc 115. (Fall)

153–54–55 **Biomedical Engineering** Loew, Zara
Seminar I–II–III (1–1–1)
The courses are taken in sequence by students in the biomedical engineering major. Students choose their specialty lab affiliation and participate in research projects of the lab. Journal club, written reports, and oral presentations. (Fall and spring)

156–57–58 **Electrical, Computer, and Biomedical Engineering** Korman
Capstone Project Lab I–II–III (1–3–2)
The courses are taken in sequence by departmental majors beginning in the second semester of the junior year. After an introduction to the formal design process, the student plans, refines, designs, and constructs a one-year project. (Fall and spring)

159 **Biomedical Properties Laboratory** (1) Loew
Experiments are selected from the random walk model of diffusion, macroscopic diffusion processes, optical extinction in tissue, carrier-mediated transport (CMT), spectroscopy, hearing measurement, DNA identification, bioinformatics, and data mining. Prerequisite or corequisite: Phys 128. (Spring)

160 **Modern Measurements and Sensors** (3) Pardavi-Horvath and Staff
Measurement of dc, ac, and high-frequency signals. Interface electronic circuits. Sensors for measurement of mechanical, optical, magnetic, electromagnetic, thermal, chemical, and biochemical signals. Prerequisite: ECE 32, 121, 140. May be taken for graduate credit. (Spring, even years)

161 **Introduction to Embedded Systems** (3) Guo and Staff
Microcontrollers and their application in embedded systems. Topics include assembly and C for microcontroller programming, serial and parallel I/O interfacing, and multimedia interfacing. Students perform laboratory experiments and a final project to develop a microcontroller-based embedded system. Prerequisite: CSci 49, ECE 141. (Spring)

162 **Design of Logic Systems II** (4) Zaghloul and Staff
Lecture (3 hours), laboratory (3 hours). Introduction of ASIC design techniques; design and programming of FPGAs using CAD tools; timing in sequential circuits; essential hazards; races in sequential circuits; design-and-build FPGA project. Prerequisite: ECE 140. (Fall)

163 **Senior Electrical and Computer Engineering Design Project Laboratory I** (3) Staff
Conception, planning, design, and construction of a one-year project. Economic analysis of the product. Use of Gantt charts. Lectures on presentation techniques, safety, grounding, project construction, and professionalism. Five project report presentations, using visual aids. Formal written reports. Prerequisite: senior status. (Fall)

164 **Senior Electrical and Computer Engineering Design Project Laboratory II** (3) Staff
Completion and demonstration of project started in ECE 163. Formal written reports, demonstrations, and oral presentations, using visual aids, of the progress of the project throughout the semester. Lectures on presentation techniques, project plans, packaging, board layout, testing procedures, user's manual, and user interfaces. Prerequisite: ECE 163. (Spring)

166 **Electrical Power Laboratory** (1) Harrington and Staff
Experiments in support of the analysis and design of electrical power systems. Measurements of the characteristics of devices to generate electric power. Rectification and inversion processes for power systems and drives. Prerequisite or corequisite: ECE 177. (Fall)

168 **Microwave and Optics Laboratory** (1) Lang
Experiments in transmission lines, network analyzer measurements of scattering parameters, microwave systems, fiber-optic systems and antennas. Introduction to the characteristics of laser and optical systems. Prerequisite: ECE 32. (Spring)

170 **Computer Engineering Laboratory I** (1) Zaghloul and Staff
Experiments in support of the theory and design of microprocessor and microcomputer hardware and software. Use of microprocessors in control of systems. Use of simulators, cross-compilers, and development systems. Prerequisite or corequisite: ECE 165, 181. (Fall)

171 **Computer Engineering Laboratory II** (1) Zaghloul and Staff
Class project, using a team approach in designing the subsystems needed to produce a complete digital computer system. Includes experience in software development, techniques for buses and local area networks, and design of I/O and memory subsystems. Prerequisite or corequisite: ECE 170, 182. (Spring)

172 **Control Systems Design** (3) Carroll and Staff
Mathematical models of linear systems; steady-state and transient analyses; root locus and frequency response methods; synthesis of linear feedback control systems. Prerequisite: ApSc 114, ECE 12 or MAE 134. (Fall)

176 **Control Systems Laboratory** (1) Carroll and Staff
Experiments in support of control theory, involving the use of the digital computer for process control in real time. Design of feedback and compensation

with computer implementation. Digital simulation of linear and nonlinear systems. Prerequisite or corequisite: ECE 172. (Fall)

177 **Electrical Energy Conversion** (3) Harrington and Staff
Fundamentals of electromechanical energy conversion. Three-phase and single-phase AC rotating machines and transformers, DC machines, rotating machines as circuit elements, power semiconductor converters, machine dynamics. Prerequisite: ECE 12, 31. (Spring)

178 **Electrical Power Systems** (3) Harrington and Staff
Introduction to electrical power systems; transmission and distribution of electrical power, three-phase circuits, symmetrical components, fault analysis. Voltage, current, and power limitations. Analysis of lightning and switching surges in power systems. Protective devices—switchgear, arresters, and isolators. May be taken for graduate credit. (Fall)

181 **Computer Organization** (3) Alexandridis
Structure and operation of a digital computer. Design of computer arithmetic units, data and instruction paths. Microprogramming; memory technology; virtual memory; caches; pipelined computer organization; characteristics of secondary storage; I/O interfacing. Prerequisite: ECE 162; corequisite: ECE 161. (Spring)

182 **Computer Architecture and Design** (3) Alexandridis and Staff
Design of bus-based digital computer systems, memory subsystems, caches, and multiple processors. Comparison of RISC and CISC processors and standard buses. Bus transfer and control signals. Performance, memory management, architectural support for protection, task switching, exception handling, instruction pipelines. Prerequisite: ECE 181. (Fall)

184 **Introduction to Biomedical Engineering** (3) Loew and Staff
Terminology of the medical profession; anatomy and physiology of the human body, from overall system and functional approaches; survey of present-day medical measurements and consideration of those areas in which engineering may be applied advantageously to medicine. May be taken for graduate credit by students in fields other than medical engineering. (Fall)

186 **Biomedical Engineering Laboratory** (1) Loew and Staff
Experiments in support of instrumentation used in medicine and biology; safety considerations. Acquisition and measurement of physiological signals (ECG, EEG, evoked potentials). Processing and interpretation of signals derived from physiological measurements. Concepts in telemetry of medical signals. Prerequisite or corequisite: ECE 184. (Fall)

187 **Introduction to Medical Imaging Methods** (3) Zara
The most used imaging modalities, including ultrasound, X-ray, MRI, CT, SPECT, and PET. Study of each modality includes an overview of linear systems and their application to techniques, basic properties of an imaging system, the physics and instrumentation behind each modality, and the advantages, disadvantages, and applications. Prerequisite: ECE 117, 184. (Spring)

188 **Introduction to Parallel and Distributed Computer Systems** (3) Alexandridis
Shared and distributed memory computer systems. Parallel computation. Interprocess communication and synchronization. Terminal, file transfer, and message handling protocols. Algorithms for deadlock detection, concurrency control, and synchronization in distributed systems. Network security and privacy. Resource control and management. Prerequisite: ECE 181. (Spring)

192 **Robotic Systems** (3) Carroll and Staff
Modeling and analysis of robot designs. Kinematics of mechanical linkages, structures, actuators, transmissions, and sensors. Design of robot control systems, computer programming, and vision systems. Use of artificial intelligence. Current industrial applications and limitations of robotic systems. Same as MAE 197. Prerequisite: computer programming, ApSc 58, ECE 172. (Spring)

196 **Robotics Laboratory** (1) Carroll and Staff
Experiments illustrating basic principles and programming of robots and other automated machinery. Design and writing of computer programs to use a robot's arm, vision, and data files to accomplish tasks. Prerequisite or corequisite: ECE 192/MAE 197. (Spring)

197 **Special Topics** (1 to 3) Staff
Topic to be announced in the *Schedule of Classes.* (Fall and spring)

198 **Research** (1 to 3) Staff
Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

ELECTRONIC MEDIA

See **Media and Public Affairs.**

EMERGENCY HEALTH SERVICES

The Bachelor of Science in Health Sciences with a major in emergency health services is described briefly under the School of Medicine and Health Sciences in this Bulletin. Complete information on the degree and the associated secondary field is available from the School of Medicine and Health Sciences.

ENGINEERING MANAGEMENT AND SYSTEMS ENGINEERING

Professors R.M. Soland, R.C. Waters, E.L. Murphree, Jr., H. Eisner, G.R. Brier, J.R. Harrald, S. Sarkani, G. Frieder, T.A. Mazzuchi (*Chair*), J.P. Deason
Associate Professors M.R. Duffey, M.A. Stankosky, H. Abeledo, J.A. Barbera, J.R. van Dorp
Assistant Professors T. Jefferson, J.C. Ryan, M.P. Hamner, A. Bada, E. Campos-Nanez
Adjunct Professors R.R. Romano, G.M. Gerson
Professorial Lecturers W.A. Goetz, S.F. Pauls, R.M. Andersen, F.R. Power, W.P. Henderson, F. Allario, C.R. Cothern, D.J. Ryan, L.W. Transeau, C.H. Voas, J.E. Collins, M.G. Goode, D.R. Skeen, F.A. Calabrese, J.F. Starns, R.C. West
Associate Professorial Lecturers R.D. Hofler, P.A. Massimini, P.G. Meikle, B.L. Lewis, S.V. Massimini, D.M. Chadwick, J.E. Beach, D.D. Steeples, S.S. Gambhir, R.B. Garrity
Assistant Professorial Lecturers C.H. Bixler, T.H. Holzer, J.R. McCumber

See the School of Engineering and Applied Science for the programs of study leading to the Bachelor of Science with a major in systems engineering and Bachelor of Arts with a major in applied science and technology.

1 **Introduction to Systems Analysis** (1) Mazzuchi, Soland
A survey of several aspects of systems analysis, including methodologies such as linear programming, network models, probability, and queuing theory, with applications to resource allocation, decision making, and statistical analysis. Hands-on spreadsheet and laboratory exercises and student projects. (Fall)

101 **Survey of Operations Research: Deterministic Models** (3) Abeledo and Staff
Basic concepts and techniques of deterministic operations research modeling as applied to problems in industrial and governmental decision making. Linear, integer, nonlinear, and dynamic programming; networks; game theory. Prerequisite: Math 32. (Fall)

102 **Survey of Operations Research: Stochastic Models** (3) Campos-Nanez and Staff
Basic concepts and techniques of stochastic operations research modeling as applied to problems in industrial and governmental decision making. Markov chains, queuing, inventory, forecasting, reliability analysis, regression analysis, and simulation. Prerequisite: ApSc 115, Math 32. (Spring)

109 **Mathematics in Operations Research** (3) Abeledo and Staff
Mathematical foundations of optimization theory; linear algebra, advanced calculus, real analysis. Geometrical interpretations. Numerical methods and use of software. Applications to modeling techniques in operations research. Prerequisite: Math 33. (Spring)

135 **Systems Thinking and Policy Modeling I** (3) Campos-Nanez and Staff
Stock-flow analysis of feedback systems presented for policy analysis and management. System dynamics; principles of systems employed to structure the problem-solving process. Problems and case studies solved using microcomputers. (Fall)

154 **Applied Optimization Modeling** (3) Abeledo and Staff
Analysis of optimization models, including areas of nutrition, water pollution, energy, reliability, inventory control, game theory, chemical equilibrium, portfolio selection, and parameter estimation. Solution of models via the GAMS

modeling software. Prerequisite: EMSE 101 and 109 or permission of instructor. (Fall)

160 **Survey of Finance and Engineering Economics** (3) Duffey and Staff
Survey of material relevant to financial decision-making for engineering activity. Includes traditional engineering economy topics; fundamentals of accounting; and financial planning, budgeting, and estimating applicable to the management of technical organizations. Same as Econ 160. (Fall, spring, and summer)

171 **Data Analysis for Engineers and Scientists** (3) Mazzuchi, van Dorp
Design of experiments and data collection. Regression, correlation, and prediction. Multivariate analysis, data pooling, and data compression. Model validation. Prerequisite: ApSc 115. (Fall)

173 **Discrete Systems Simulation** (3) van Dorp and Staff
Simulation of discrete stochastic models. Simulation languages. Random-number/random-variate generation. Statistical design and analysis of experiments, terminating/nonterminating simulations; comparison of system designs. Determination of input distributions. Variance reduction. Validation of models. Prerequisite: ApSc 116, CSci 51, or permission of instructor. Same as Stat 173. (Spring)

182 **Quality Control and Acceptance Sampling** (3) Mazzuchi and Staff
Statistical approaches to quality assurance. Single and multivariate control charts, acceptance sampling by attributes and variables, process capability and design of experiments. Prerequisite: ApSc 115 or permission of instructor. (Spring)

191 **Systems Engineering Senior Project** (3) Soland and Staff
Field experience in systems engineering on a team basis. Each small group confronts an actual problem and formulates a solution using systems engineering methods and models. Oral and written reports. Prerequisite or corequisite: EMSE 154, 171, 173, 182. (Spring)

198 **Research** (1 to 3) Staff
Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

ENGLISH

Professors R.N. Ganz, Jr., J.A.A. Plotz, C.W. Sten, D. McAleavey, O.A. Seavey, L.B. Salamon, A. Romines, J.A. Miller, J. Shore, F. Moskowitz (*Chair*), M.D. Clair, M. Alcorn, J.J. Cohen, J.G. Harris
Associate Professors R.L. Combs, G. Carter, K. Moreland, D. Moshenberg, M.S. Soltan, T.G. Wallace, J.M. Green-Lewis, P. Cook, P. Chu, G. Wald, V. Chandra, P. Griffith, E. Schreiber, M. Frawley
Assistant Professors R. McRuer, C.A. Leenerts, A.B. Levine, K. Daiya, J.C. James, M.D. Jones, S. Lovelady, S.P. Willens, F. Minwalla, S. Salchak
Adjunct Assistant Professors D. Scarboro, S. Maley, L. Raphael, M. Wallace
Adjunct Instructor S. Gold
Jenny McKean Moore Writer in Washington J. Hackett

Bachelor of Arts with a major in English—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Engl 51–52 or 61–62 or 71–72 or 73–74 or 91–92; or Hmn 1, 2; or Honr 15–16.
3. Required courses in related areas—second-year proficiency in a single foreign language, as demonstrated by completion of two years of college-level language study or the equivalent. (In the case of Latin, Latin 3 is sufficient.)
4. Required for the major—33 credit hours of 100-level English courses, including the following:

a) 9 hours in literature before 1800 (Engl 112, 113, 125, 127–28, 130, 131–32, 153, 155, 160)

b) Engl 120 and 3 additional hours in literary theory and/or cultural studies (Engl 124, 137, 175, 179, 195, 196)

c) 3 hours in minority or post-colonial literature and tradition (Engl 139–40, 169, 173, 174, 179, 187, 188)

d) 3 hours in 19th-century literature (Engl 133, 135–36, 154, 161, 162, 163, 165, 167)

e) 3 hours in 20th-century literature (Engl 137, 139–40, 157–58, 164, 166, 168, 170, 177–78)

With departmental approval, courses with appropriate subject matter may be substituted for those specified above.

Beyond the 24 specified hours, students take 9 additional hours of 100-level English courses, which may be in creative writing or composition. With approval of the English Department, 6 hours in the literature of a foreign language (either in the original language or in translation) may be substituted for English electives.

Special Honors—Majors in English who wish to be considered for Special Honors must meet the requirements listed under University Regulations; have maintained a 3.0 grade-point average; and apply for admission to the program, in writing, by October 15 of the junior year. Once admitted, the candidate must enroll in Engl 195 in the spring semester and in Engl 196 in the following fall semester. During the junior year, candidates must continue to maintain a 3.0 overall grade-point average and a 3.25 average in courses in the English Department. Subject to departmental approval, the candidate enrolls in Engl 194 or 198 in the spring semester of the senior year. To be eligible for graduation with Special Honors, candidates must earn an *A* on the Honors Thesis and have achieved a 3.4 grade-point average in courses in the English Department.

Bachelor of Arts with a major in English and creative writing—Except for the requirement of a creative thesis, this major closely resembles the curriculum that is followed by an English major pursuing a creative writing minor. Admission to the major is restricted, and a separate application must be filed in writing prior to the senior year. No more than two students per thesis director are accepted per year.

The major in English and creative writing requires 39 credit hours of 100-level English courses, matching items 1 through 4(e) indicated under the Bachelor of Arts with a major in English, with the additional requirements of Engl 81 as a prerequisite and 15 hours of 100-level creative writing courses, including 9 hours in the writing of either poetry or fiction and Engl 194.

Bachelor of Arts with a major in dramatic literature—The Department of Theatre and Dance and the Department of English offer an interdisciplinary major in dramatic literature. See Dramatic Literature.

Minor in English—6 hours of introductory literature courses and 15 hours of 100-level literature courses, chosen in consultation with an advisor in the department.

Minor in creative writing—Engl 81, 6 hours of introductory literature (e.g., Engl 51–52), and 15 hours of 100-level courses offered by the department, of which at least 12 must be in creative writing, including at least 9 hours in poetry (Engl 104, 107, and 117 or 181) or 9 hours in fiction (Engl 103, 106, and 116 or 181) or 6 hours in playwriting (Engl 105, 108).

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Departmental prerequisite: A 3-credit-hour literature survey, such as Engl 51 through 92, is prerequisite to all 100-level English courses with the exception of Engl 111, 160, 161, and 162. All courses offered by the English Department have an initial prerequisite of Engl 9 or 10 or UW 20.

The admission of international students to any English composition course is determined by the EFL Placement Test, administered by the office of English as a Foreign Language (see Students from Foreign Institutions, under Admissions).

EXPOSITORY WRITING

9 **English Composition: Language as Communication** (3) Alcorn and Staff
Parallels content of Engl 10; offers more intensive work on analytical and critical reading, fluency, and control over the writing process. Smaller class size and five hours per week afford more attention to each student. (Fall)

10 **English Composition: Language as Communication** (3) Alcorn and Staff
Critical examination of the ways of language and of writers; active analysis of language as discursive and as cultural, with special attention paid to the prose essay. Emphasis on the writing process, with guidance in revising towards clear, persuasive, and engaging prose. Thematically organized content-based seminars; texts and course topics vary among sections. (Fall and spring)

11 **English Composition: Language and the Arts and Sciences** (3) Alcorn and Staff
Critical examination of language and discourse in the diverse, disciplinary communities of the university. Focuses on the extended, documented, independently conceived research essay and project. Thematically organized content-based seminars; texts and course topics vary among sections. (Fall and spring)

100 **Intermediate Expository Writing** (3) Staff
Concentration on perfecting the skills of addressing a variety of audiences, focusing and organizing the essay, varying tone and method of discourse, and using appropriate vocabulary in several subjects. Texts and topics vary. Prerequisite: Engl 11 or UW 20 or equivalent. Limited to 15 students.

101 **Advanced Writing** (3) Staff
Individualized instruction and frequent conferences; writing projects vary with each student according to needs and interests. Emphasis on developing professional work habits. Prerequisite: Engl 11 or UW 20, or written permission of instructor. Limited to 15 students. (Fall and spring)

111 **Preparation for Peer Tutors in Writing** (3) Schreiber
For undergraduates accepted as tutors in the Writing Center: study and practice of techniques for prewriting, writing, and revision; readings on collaborative learning, the composing process, composition theory, cognitive psychology, critical thinking, and the teaching of writing; observation and exercises in writing, peer review, and tutoring. (Fall)

CREATIVE WRITING

81 **Introduction to Creative Writing** (3) McAleavey and Staff
An exploration of genres of creative writing (fiction, poetry, and/or playwriting). Basic problems and techniques; examples of modern approaches; weekly writing assignments; workshop and/or conference discussion of student writing. Prerequisite: Engl 11 or UW 20. Limited to 15 students. (Fall and spring)

103 **Intermediate Fiction I** (3) Moskowitz, Clair, Chandra, Griffith, and Staff
The writing of fiction. Prerequisite: Engl 81 or equivalent and two semesters of literature courses. Limited to 15 students. (Fall and spring)

104 **Intermediate Poetry I** (3) McAleavey, Clair, Bolz, Shore, and Staff
The writing of poetry. Prerequisite: Engl 81 or equivalent and two semesters of literature courses. Limited to 15 students. (Fall and spring)

105 **Fundamentals of Dramatic Writing** (3) P. Griffith
Same as TrDa 105. A workshop in playwriting and screenwriting, with emphasis on dramatic structure. Prerequisite: Engl 81 or equivalent and two semesters of literature courses. Limited to 15 students. (Fall)

106 **Intermediate Fiction II** (3) Moskowitz, Clair, Chandra
The writing of fiction. Prerequisite: Engl 103 or equivalent. Limited to 15 students. (Fall and spring)

107 **Intermediate Poetry II** (3) McAleavey, Bolz, Clair, Shore
The writing of poetry. Prerequisite: Engl 104 or equivalent. Limited to 15 students. (Fall and spring)

108 **Intermediate Dramatic Writing** (3) P. Griffith
Same as TrDa 108. A workshop developing scripts for both theatre and film. Prerequisite: Engl 105 or equivalent. Limited to 15 students. May be repeated for credit with departmental approval. (Spring)

116 **Advanced Fiction** (3) Moskowitz, Clair, Chandra
Further workshop study of the writing of fiction. Prerequisite: Engl 106 or equivalent. Limited to 15 students. May be repeated for credit with departmental approval. (Spring)

117 **Advanced Poetry** (3) McAleavey, Shore, Bolz
Further workshop study of the writing of poetry. Prerequisite: Engl 107 or equivalent. Limited to 15 students. May be repeated for credit with departmental approval. (Spring)

181 **Creative Writing Workshop** (3)
Taught by the Jenny McKean Moore Writer in Washington; open to undergraduates and graduate students. Prerequisite: a 100-level creative writing course. May be repeated for credit, if taught by a different instructor. Limited to 15 students. (Fall and spring)

182 **Special Topics in Creative Writing** (3) Chandra, Clair, McAleavey, Moskowitz, Shore, Griffith

Topics announced in the *Schedule of Classes*; may be repeated for credit provided the topic differs. Topics of projected courses include poetry and poetics; forms and methods in fiction; forms and methods in poetry; memoir and personal narratives; creative nonfiction; "Literature, Live!"; avant-garde and experimental writing. Limited to 15 students.

194 **Creative Writing Senior Thesis** (3) Chandra, Clair, McAleavey, Moskowitz, Shore, Griffith

Under the guidance of an instructor, the student composes an original manuscript of poetry or short fiction accompanied by an essay situating the student's work in the contemporary context. Open only to seniors admitted to the English and creative writing major. (Fall and spring)

ENGLISH AND AMERICAN LITERATURE

51–52 **Introduction to English Literature** (3–3) Plotz, Salamon, and Staff

Representative works by major authors studied in their historical context; discussion of recurrent themes and introduction to various types and forms of imaginative literature. Engl 51; Middle Ages through the 18th century. Engl 52: 19th and 20th centuries. (Academic year)

61 **Tragedy** (3) Carter

Modes of tragedy as developed in drama, nondramatic verse, and prose fiction in literature from ancient to modern times—Book of Job to Beckett.

62 **Comedy** (3) Staff

Modes of comedy as developed in drama, nondramatic verse, and prose fiction—Chaucer to Borges.

71–72 **Introduction to American Literature** (3–3) Seavey, Combs, Moreland, and Staff

Historical survey. Engl 71: From early American writing through Melville, Whitman, and Dickinson. Engl 72: From Twain, James, and Crane to the present. (Academic year)

73–74 **Literature of Black America** (3–3) Miller, Wald, James, Jones, and Staff

Survey of the major periods and principal authors of the African American tradition. Engl 73: 1700–1900. Engl 74: 20th century. (Academic year)

91–92 **Survey of Postcolonial Literature** (3–3) Plotz, Daiya, and Staff

Introduction to postcolonial literature from the perspectives of colonizer and colonized in Great Britain, India, Pakistan, Bangladesh, Sri Lanka, Australia, New Zealand, Canada, Anglophone Africa, and the Caribbean region; literature written on the wing, in diaspora. (Academic year)

112 **Chaucer** (3) Cohen

Chaucer's major works seen as exciting, lively texts from the modern perspective and as products of specific economic, social, and cultural trends of the late 14th century. Focus on *The Canterbury Tales*, read in the original Middle English.

113 **Medieval Literature** (3) Cohen

Readings from a wide range of medieval genres, including romances, saints' legends, mystical narratives, lyrics, civic drama, and social satires, to explore some of the principal concerns of medieval culture. How these texts responded to and shaped changing patterns of medieval culture, as the clergy, the aristocracy, and the urban bourgeoisie attempted to define a culture of their own.

120 **Critical Methods** (3) Alcorn, Betensky, Cook, James, Soltan

The topics and techniques of literary analysis, applied to English and American poetry, prose fiction, and drama. Attention to stylistic and structural analysis, narratology, and critical theory applied to specific literary texts. (Fall and spring)

124 **Play Analysis** (3) Minwalla

Same as TrDa 124. Examines both traditional and nontraditional (Aristotelian and non-Aristotelian) approaches to the analysis of dramatic literature and explores literary and theatrical techniques used by playwrights. (Spring, odd years)

125 **The English Renaissance** (3) Salamon

Verse and prose written in the period 1515–1625, examined in relation to continental culture and to the social institutions that shaped English culture. More,

Sidney, Spenser, Shakespeare, Donne, Jonson, Bacon, Herbert considered in relation to Petrarch, Castiglione, Aristo, Erasmus, Montaigne, Labé, Descartes.

127–28 **Shakespeare** (3–3) Salamon, Harris
Close study of six or seven plays each semester, with emphasis on the texts in history and ideology. Survey of current critical practices (feminist, materialist, psychoanalytic) and examination of Shakespeare as a cultural institution. (Academic year)

129 **Topics in Shakespeare Studies** (3) Salamon, Cook, Cohen, Wallace, Harris
Critical study of a particular aspect of Shakespeare's work, or of a distinctive approach to the plays. Projected topics: Shakespeare on film, the history plays and Elizabethan England, 18th century rewritings of Shakespeare, Shakespeare as poet, cultural materialist readings of Shakespeare.

130 **Milton** (3) Cook
Study of the major works in verse and prose, following the course of Milton's career. (Spring)

131–32 **The 18th Century: Literature and Authority** (3–3) Wallace, Seavey
Readings in significant 18th-century English writers—Dryden, Swift, Pope, Johnson, and others—with emphasis on tracing the ways in which literary texts contain, perpetuate, and subvert social and political ideologies.

133 **The Romantic Movement** (3) Plotz
Major figures and topics in English and Continental romanticism: Blake, Wordsworth, Coleridge, Lamb, Byron, Shelley, Keats, Hazlitt, DeQuincey, and others.

134 **Children's Literature** (3) Plotz
Nineteenth- and twentieth-century children's texts that illuminate the several worlds of childhood: the "small world" of childhood perception, the larger world of social and historical forces, and the "secondary world" of fantasy.

135–36 **Victorian Literature** (3–3) Carter, M. Frawley
Engl 135: 1830–1865—E. Brontë, Dickens; Tennyson, Browning, Arnold; Darwin, Carlyle, Ruskin. Engl 136: 1865–1900—Eliot, Hardy, Conrad; Swinburne, the Rossettis, Morris; Pater, Wilde, the Nineties.

137 **Modernism** (3) Soltan, Green-Lewis
The emergence of modernist experimentation (and the sense of epistemological and moral crisis it expressed) in the poetry and prose of Pound, T.S. Eliot, Woolf, Kafka, and others.

139–40 **20th-Century Irish Literature** (3–3) Staff
Irish writers from the time of the Literary Revival in the late 19th century to the present. Engl 139: Yeats and other Irish poets and playwrights of his time and after—Synge, O'Casey, Kavanagh, Heaney, and others. Engl 140: Joyce through *Ulysses* and other fiction writers of later generations—O'Brien, Beckett, and others. (Academic year)

153–54 **The English Novel** (3–3) Wallace, Soltan
Engl 153: The 18th century—Defoe, Richardson, Fielding, Sterne, and others. Engl 154: The 19th century—Austen, the Brontës, Dickens, George Eliot, Hardy, and others. (Academic year)

155–56 **The English Drama** (3–3) Cook, Minwalla
Engl 155: Shakespeare's contemporaries. Engl 156: Historical survey, 1660 to present.

157 **Modern Drama** (3) Minwalla
Representative continental, English, and American plays, 1900–1960.

158 **Contemporary Drama** (3) Staff
Examines drama written since 1960 in the light of postmodernism as both a literary and a theatrical theory. Explores the ways contemporary playwrights and directors challenge the perceptions and assumptions of today's audience.

160 **Early American Literature and Culture** (3) Seavey
The shaping of America's early literary and cultural traditions as shown by significant writers of the colonial and early national periods: Bradstreet, Cotton Mather, Edwards, Franklin, Crevecoeur, and others. (Fall)

161 **American Romanticism** (3) Sten
The shaping of America's literary and cultural traditions as shown by significant writers of the Romantic era: Poe, Emerson, Hawthorne, Melville, Thoreau, Whitman, Dickinson, and others. (Spring)

162 **American Realism** (3) Romines
The shaping of America's literary and cultural traditions as shown by significant writers of the Realist school: Twain, James, Crane, Howells, Wharton, Chopin, Robinson, and others. (Fall)

163–64 **American Poetry** (3–3) Combs, McAleavey, Jones
Close examination of major American poems. Engl 163: From the beginnings to the early 20th century: works by Poe, Emerson, Whitman, Dickinson, and others. Engl 164: Since the early 20th century: Frost, Eliot, Stevens, Bishop, Hughes, Ashbery, and others.

165–66 **American Drama** (3–3) Combs
Engl 165: 19th-century melodrama and the emergence of realism; works by O'Neill and other dramatists of the early 20th century. Engl 166: Developments in modern American drama since World War II, including works by Williams, Miller, Albee, Shepard, Rabe, Guare, Mamet, Henley, Wasserstein, Shange, Hwang, Wilson, and others.

167–68 **The American Novel** (3–3) Seavey, Moreland, Sten
Historical and critical study of major works in the American novelistic tradition. Engl 167: From the beginnings through the 19th century: Hawthorne, Melville, James, Twain, Dreiser, and others. Engl 168: The 20th century: Wharton, Cather, Anderson, Hemingway, Fitzgerald, Faulkner, Wright, R.P. Warren, Nabokov, and others. (Academic year)

169 **Ethnicity and Place in American Literature** (3) Chu, Miller, James, Jones
The relationships among ethnic identity, authorship, regional setting, and national consciousness. Differences in the literary culture of ethnically, racially, and regionally diverse American populations; how considerations of ethnicity and place have been reshaping the American literary canon. Texts and emphases vary with instructor.

170 **The Short Story** (3) Combs
An extensive survey of short fiction by a wide variety of writers of the 19th and 20th centuries, about half of them American; readings on the art of the short story by writers and literary critics.

171 **Major Authors** (3) Staff
In-depth studies of a single figure or two or three authors (of British, American, or other nationality) who have written in English. Topics announced in the *Schedule of Classes*; may be repeated for credit provided the topic differs.

172 **Selected Topics in Literature** (3) Staff
Topics announced in the *Schedule of Classes*; may be repeated for credit provided the topic differs. Topics of projected courses include the Bloomsbury group; children's literature; southern literature; the picaresque; literature of the Holocaust; literature and politics; Freud, Dostoevsky, and Shakespeare.

173 **Selected Topics in Post-Colonial Literature** (3) Plotz, Daiya
Historical, critical, and theoretical study of post-colonial literatures—African, Asian, Commonwealth—written in English. Topics vary with instructor; may be repeated for credit provided the topic differs.

174 **African American Literature** (3) Wald, Miller, James, Jones
Study of texts representing the experiences of black Americans and the ideas and social forces that have shaped their lives and writings. (Fall and spring)

175 **Gender and Literature** (3) Romines, Wald
Symbolic representations of culturally defined roles and assumptions in literature. Male and female gender roles as fundamental to culture; the representation of culture, in literature especially and in the arts and humanities generally.

177–78 **Contemporary American Literature** (3–3) Moskowitz, Chu, Moreland
Engl 177: Tradition and innovation in fiction, memoir, and poetry of the 1950s and '60s: Bishop, Creeley, Ginsberg, Johnson, Kerouac, Levertov, Baldwin, Barth, Kingston. Engl 178: Aspects of multicultural American identities in bildungsroman, memoir, poetry, and drama of the 1970s, '80s, and '90s: Guterson, Murayama, Tan, Brooks, Cisneros, Rodriquez, Silko, Alexie, Rich.

179 **Special Topics in Literary Theory and/or Cultural Studies** (3) Alcorn, McRuer, Moshenberg, Wald
Selected topics in the diverse theoretical methodologies and interdisciplinary studies that characterize contemporary English and American literary studies. May be repeated for credit provided that topic differs.

187 **Asian American Literature** (3) Chu
How Asian American writers claim America and construct their identities in dialogue with shifting ideas of "America." Topics addressed: Asian American history, gendering subjects, orientalism and postcolonial subjectivity, interracial relations, canonization. Representative writers: Kingston, Hwang, Okada, Chang-rae Lee, Okja Keller, Lahiri, Bulosan, Hagedorn.

188 **Jewish American Writing** (3) Plotz
One hundred years of Jewish American writing in fiction, autobiography, poetry, drama, and non-fictional prose. The immigrant experience, American philosemitism and antisemitism, the Holocaust and after, the New York intellectuals, Jewish feminism, and the patriarchal tradition.

195–96 **Honors Seminar** (3–3) Green-Lewis, Soltan, Wallace
Genre and genre theory; literature as cultural artifact and as instrument of cultural criticism; various critical approaches—ideological, historical, and ahistorical. Open only to second-semester junior and first-semester senior honors candidates in English. (Engl 195: spring; Engl 196: fall)

197 **Independent Study** (3) Moskowitz and Staff
For exceptional students, typically majors, whose academic objectives are not accommodated in regular courses. Students must obtain the chair's approval and arrange for supervision by an appropriate member of the department. (Fall and spring)

198 **Honors Thesis** (3) Staff
Under the guidance of an instructor, the student writes a thesis on an approved topic. Open only to senior honors candidates in English. (Fall and spring)

199 **Internship: Research and Writing** (3) Cook and Staff
Position of responsibility with a publication or an educational or cultural institution or other organization offering practical experience in research and writing. Restricted to junior and senior English majors; requires departmental approval of plans prior to registration. Regular meetings with supervising professor.

ENGLISH AS A FOREIGN LANGUAGE

Director of the Language Center M.R. Gonglewski

5 **Introduction to Academic Writing for Undergraduates** (0) Siczek
Introduction to the research/writing process. Practice in reading university-level materials and reading-based writing. Focus on revision and editing. Eight class hours per week. Tuition is charged at the rate of 4 credit hours.

10 **English Composition for International Students I** (3) Siczek and Staff
Expository writing and advanced research course for undergraduates who demonstrate high proficiency in English. Four class hours per week. Prerequisite: EFL 5 or the EFL Placement Test. Special fee, $25.

11 **English Composition for International Students II** (3) Siczek and Staff
Development of the critical reading, research, and persuasive writing skills necessary for active participation in the academic community. Analysis of diverse texts; composition and documentation of an independently conceived research project. Prerequisite: EFL 10.

46 **EFL Tutorial** (0) Staff
Individualized instruction in specific skill areas. Departmental approval required. Tuition is charged at the rate of 1, 2, or 3 credit hours, for 1, 2, or 3 hours of instruction per week, respectively.

110 **Academic Writing and Research for Graduate Students I** (0) Mueller
The research/writing process. Practice in reading university-level materials and reading-based writing. Focus on revision and editing. Eight class hours per week. Tuition is charged at the rate of 4 credit hours.

111 **Academic Writing and Research for Graduate Students II** (3) Mueller
Academic writing and advanced research course for students who demonstrate high proficiency in English. Small group work and oral presentations on research.

ENVIRONMENTAL STUDIES

See **Earth and Environmental Sciences.**

EXERCISE SCIENCE

Professors D.C. Paup (*Chair*), P.A. Sullivan, W.C. Miller
Associate Professors J.V. Danoff, B.J. Westerman
Instructors A.A. Dickman, L. Washington-Lofgren
Adjunct Associate Professors E.D. Schulken, L.F. Hamm

See the School of Public Health and Health Services for programs of study leading to the Bachelor of Science with majors in exercise science and athletic training. The exercise science courses that follow are available to undergraduates in other schools and may be used toward a secondary field in exercise science.

EXERCISE SCIENCE

50 **Emergency Procedures and Safety Skills** (2)
Introduction to common safety principles, predisposing factors and common causes of accidents, injuries, and illnesses. This is an American Red Cross certification course in cardiopulmonary resuscitation, use of an automated external defibrillator, and first aid. Laboratory fee, $13.

101 **Topics** (1 to 3)
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

102 **Introduction to Athletic Training** (3)
Introduction to the profession of athletic training. Exploration of topics related to athletic training and sports medicine.

103 **Professional Foundations in Exercise and Sport Science** (3)
Nature, scope, and scientific basis of exercise and sport science: orientation to professional competencies and opportunities.

107 **Personal Health and Wellness** (3)
A survey of the various components involved in personal health and wellness, such as personal fitness, sexuality, mental health, and environmental health. Emphasis is on application of knowledge through the use of decision-making and behavior modification skills.

109 **Fitness Testing and Prescription** (4)
Evaluation of aerobic capacity, muscular strength, flexibility, and ideal body weight; development of prescribed exercise programs. Laboratory fee, $40.

120 **Body Image in the Concept of Health** (3)
Background and concepts of body dissatisfaction, disordered eating, food preoccupation, and exercise obsession.

121 **Current Concepts in Nutrition and Health** (3)
Basic nutritional concepts and their relation to health and disease.

123 **Developing Health and Fitness Programs** (3)
An introduction to program planning, with concepts and theories relevant to the adoption and maintenance of physically active lifestyles and the selection and implementation of successful health and fitness programs. Methods and strategies appropriate for use at the individual, community, and policy level.

125 **Human Sexuality** (3)
Biological and developmental aspects of human sexuality; psychological and emotional aspects of sexual behavior; sexual identity; social forces affecting sexual issues; and research trends in the area of human sexuality.

126 **Medical Issues in Athletic Training** (3)
General medical issues and pharmacology as they relate to the profession of athletic training.

134 **Sport and Nutrition** (3)
The nutrition needs for recreational exercise and sports; skills in assessing nutrition needs; development of individual nutrition programs that are sport/activity-specific; and identification and correction of nutrition problems affecting sports performance.

135 **Sport and the Law** (3)
Basic principles of the law as it applies to amateur and professional sports. Legal issues and their ramifications.

136 **Issues in Women's Health** (3)
An introduction to health promotion and disease prevention pertaining especially to diseases, disorders, and conditions that are more prevalent among or

unique to women or for which risk factors or interventions may differ for women and men. Topics are covered from epidemiological, sociocultural, historical, and behavioral perspectives.

137 **Athletic Training Administration** (3)
Standards, policies, and practices of organization, supervision, and administration of athletic training programs.

138 **Administration of Health and Fitness Programs** (3)
Basic principles related to the administration of programs in the fitness, exercise, sport and sports medicine fields.

139 **Principles of Coaching** (3)
Study of coach/athlete behavioral patterns and interactions, coaching methods, and interdisciplinary principles applicable to coaching.

140 **Exercise and Sport Psychology** (3)
Study of psychological aspects of sport participants, athletes, teams, and competition in sport situations, including personality, motivation, performance level, achievement, and behavioral change strategies; social factors, training events, and measurement techniques. Prerequisite: Psyc 1.

141 **Psychology of Injury and Performance** (3)
A study of various areas within the behavioral sciences related to the rehabilitation and prevention of injuries and the injured physically active individual.

145 **Working, Stress, and Human Values** (3)
Recognition, prevention, and control of stress and the burnout syndrome. A humanistic inquiry into values, attitudes, and stressors associated with various professions. Admission by permission of instructor.

146 **Stress Management, Burnout, and Human Potential** (3)
The nature, prevention, and control of the stress and burnout syndrome. Students will design an overall stress management strategy that incorporates achievement of life goals and human potential in a stress-efficient manner. Admission by permission of instructor.

151 **Kinesiology** (3)
Analysis of human movement with emphasis on the biomechanics of exercise and sport movement patterns. Prerequisite: EXSC 154 or equivalent, an approved course in anatomy.

152 **Physiology of Exercise** (4)
The physiological functions of the body and the effect of exercise on these functions. Prerequisite: ExSc 154–55 or permission of instructor. Laboratory fee, $40.

154–55 **Applied Anatomy Physiology I–II** (4–4)
Fundamentals of human anatomy and physiology for students preparing for health sciences professions. Emphasis on bones, joints, muscles, innervation, and blood supply. Laboratory fee, $40 per semester. Prerequisite to ExSc 155: ExSc 154.

158 **Prevention and Care of Athletic Injury** (3)
Lectures and lab sessions on prevention, recognition, and care of injuries that occur to physically active individuals. Prerequisite: ExSc 154–55 or equivalent. Laboratory fee, $40.

159 **Physical Assessment of Athletic Injury** (4)
Lectures and lab sessions on assessment of injuries that occur to physically active individuals. Prerequisite: ExSc 158. Laboratory fee, $40.

160 **Prevention and Care of Athletic Injury Lab** (1)
Laboratory complement to ExSc 158; required for athletic training majors.

161 **Athletic Training Practicum** (3)
For athletic training majors only. Practical experience in related disciplines. To be taken over four semesters for a total of 12 credit hours.

168 **Therapeutic Modalities in Sports Medicine** (4)
Explanation and demonstration of the use of therapeutic modalities on the healing process, including discussion of the use of therapeutic modalities to enhance the rehabilitation process after athletic injury. Prerequisite: ExSc 159 or permission of instructor. Laboratory fee, $40.

169 **Therapeutic Exercise in Sports Medicine** (4)
Discussion and application of general rehabilitation techniques to specific athletic injuries, including evaluation, implementation, and follow-up after specific joint injuries. Prerequisite: ExSc 159 or permission of instructor.

171 **Issues in Exercise Science** (3)
Study of current literature with implications for exercise and sport science specializations; use of library resources and retrieval systems; evaluation of professional competencies. For senior exercise science majors only.

173 **Independent Study** (1 to 3)
For departmental majors only. Individually designed model for intensive study in an area of special interest. Prerequisite: demonstrated competency for independent work and permission of advisor and instructor. May be repeated for credit.

175 **Internship** (1 to 9)
For departmental majors. Admission by permission of advisor.

EXERCISE AND SPORT ACTIVITIES

With the exception of undergraduates enrolled in the School of Public Health and Health Services, credit for exercise and sport activities courses is not recognized for the baccalaureate. The University is not responsible for injuries received in any of the activities of these courses, and the student assumes full responsibility therefor.

10 **Badminton** (1)
Students learn the mechanics of the basic skills and practice to improve the execution of a variety of serves, serve returns, clears, drops, drives, and smashes. Strategy for singles, doubles, and mixed doubles play.

20 **Beginning/Intermediate Golf** (1)
All aspects of the game of golf and its rules. Fundamentals of the golf swing, the short game, and course management. On-course experience. Course fee: $60.

21 **Foil Fencing** (1)
Basic positions and fundamental movements of foil fencing; overview of the entire sport.

22 **Basketball** (1)
Fundamental skills, practice, rules, and scoring.

24 **Volleyball** (1)
Fundamental skills, practice, rules, and scoring.

26 **Karate** (1)
Introduction to Shotokan Karate, with an emphasis on realistic self-defense and development of the mind–body connection. Basic stances, blocks, and strikes of Shotokan.

27 **Beginning/Intermediate Tennis** (1)
Basic components and techniques, with opportunities to practice and demonstrate tennis skills by performing drills and playing matches against fellow classmates.

28 **Massage** (1)
Physiological effects of stress on the muscular system and how massage is used to address these effects. Proper technique and application of Swedish Massage strokes and other related therapies. Course fee: $10.

29 **Yoga** (1)
Introduction to Hatha Yoga; basic postures and breathing.

30 **Fitness—Selected Activities** (1)

31 **Weight Training** (1)
Weight training techniques and related concepts of anatomy, nutrition, and exercise physiology. Emphasis on safety, form, benefits, and personal goals.

32 **Aqua Aerobics** (1)
Aerobic conditioning, muscle toning, and increased flexibility using water resistance. Emphasis on the positive impact of regular physical fitness.

33 **Swimming** (1)
Basic components of swimming and development of proper stroke mechanics in the four styles of swimming: freestyle, backstroke, breaststroke, and butterfly.

37 **Indoor Soccer** (1)
Technical and tactical aspects of the sport are addressed.

38 **Racquetball** (1)
Rules, basic skills, and strategies.

39 **Cardio-Kick-Boxing** (1)
Exposure to a variety of hand and foot techniques from boxing and traditional martial arts, with an emphasis on learning to work out at a safe and challenging level for improved strength, flexibility, and cardiorespiratory fitness.

40 **Self-Defense and Personal Safety** (1)
Development of an understanding of assault and the wide range of options for self-defense. Drills of verbal assertiveness, concentration/relaxation, and physical defense. Concepts of alignment, balance, and the mechanics of generating force.

41 **Mat Pilates** (1)
Basic understanding of the principles of Pilates, including postural alignment, breathing techniques, strengthening, and stretching.

42 **Aerobics** (1)
A variety of aerobic activity, including step, high/low, hip-hop, sports training, and power walking. Each class includes a warm-up, aerobic segment, and cool down.

43 **Tai Chi** (1)
Introduction to the art of Tai Chi Ch'uan. Focus on the solo form, which is a series of slow, circular, continuous movements. Tai Chi principles, philosophy, and history. Body alignment, kinetics, and warm-up exercises.

44 **Aikido** (1)
Aikido helps participants deal with stressful and threatening situations and defend themselves if necessary in situations where force and violence is imminent.

45 **Experimental Activities** (1)
Topic and amount of laboratory fee (if charged) announced in *Schedule of Classes*. May be repeated for credit.

46 **Taekwondo** (1)
The fundamental techniques and training regimen of taekwondo, a Korean martial art. Beginning students become proficient in the techniques required for a promotion to yellow belt. More advanced students receive training appropriate to their rank.

47 **Bowling** (1)
Basic components and skills for this lifetime sport.

48 **Horseback Riding** (1)
Theory and practice for beginning, intermediate, and advanced level students. Course fee: $350.

49 **In-Line Skating** (1)
Students learn to skate and stop, in control and with confidence.

50 **Shiatsu** (1)
Balanced and centered movements are drawn from the martial arts of Tai Chi Ch'uan Aikido, a method of self-development.

53 **Squash** (1)
Basic rules, skills, and the strategies involved in the game.

56 **Scuba Diving Certification Course** (2)
This is an entry-level PADI (Professional Association of Diving Instructors) course, leading to international diver certification. The student is introduced to the techniques and theories of safe diving in pool and lecture sessions. Course fee: $150.

57 **Scuba Lab** (1)
Open water dive certification lab. Course fee: $150.

60 **CPR/First Aid** (1)
At the completion of the course the student will be able to address adult, child, and infant choking and perform rescue breathing and CPR techniques as taught by the American Red Cross. Course fee: $13.

61 **Lifeguard Training Certification Course** (2)
Skills and knowledge needed to prevent and respond to aquatic emergencies. Course content and activities prepare lifeguard candidates to recognize and respond quickly and effectively to emergencies and prevent drowning and other incidents. Course fee: $10.

62 **Conditioning/Weight Training** (2)
The fundamentals and theory behind various methods of weight training, cardiovascular fitness, and nutrition.

66 **Sports Massage** (2)
Principles of orthopaedic sports massage, the musculoskeletal conditions that can benefit from it, and performance of these massage techniques. Course fee: $10.

67 **Aerobics Instructor Training** (2)
Fundamentals of instruction for a group exercise leader. Participants develop the skills needed to teach a safe, enjoyable, and effective group exercise class.

68 **Sport Clinics and Workshops** (1 to 3)
Special intensive study and skill development. There may be a laboratory fee, amount announced in *Schedule of Classes.*

FILM STUDIES

Committee on Film Studies
P. Rollberg (*Chair*), Y. Captain, V. Chandra, H. Feigenbaum, K. Harvey, A. Hiltebeitel, B. Mergen, N. Seavey, J.-F. Thibault

Minor in film studies—Students in Columbian College of Arts and Sciences may earn a minor in film studies by completing the four core courses below plus three additional film courses chosen from AmSt/AH 192, Fren 131, 132, Ger 181, Japn 162, Phil 62, Slav 185, 186, Span 131.

151 **Film Theory** (3)
A reading-intensive immersion in classical film aesthetics and a survey of the theoretical and critical canon of cinema literature. Laboratory fee, $30. (Fall)

152 **Genres of Film** (3)
An exploration of the relationship between cinematic structure and narrative content in various types of film. Laboratory fee, $30. (Spring)

153–54 **History of World Cinema I–II** (3–3)
A two-semester sequence covering 100 years of international cinematic history from an aesthetic and political point of view. Laboratory fee, $30 per semester. (Academic year)

FINANCE

Professors T.M. Barnhill, W. Handorf, M.S. Klock (*Chair*), S. Phillips, I.G. Bajeux-Besnainou, G.M. Jabbour, R.K. Green
Associate Professors J.M. Sachlis, N.G. Cohen, P.S. Peyser, A.J. Wilson, P.R. Locke
Assistant Professors R. Savickas, K.L. Neuhauser, S. Agca, G. Jostova, A. Baptista
Professorial Lecturers S. Uyanik, J. Overdahl
Associate Professorial Lecturers R. Strand, T. McCormick

See the School of Business for programs of study leading to the degrees of Bachelor of Accountancy and Bachelor of Business Administration.

Departmental prerequisite: BAdm 115 is prerequisite to all courses in the Finance Department.

122 **Intermediate Finance** (3) Staff
Theory and practice of acquiring and using funds. Simulations of business decisions by cases and/or models to assess the risk/return interaction of investment, financing, and dividend decisions. (Fall and spring)

123 **Investment and Portfolio Management** (3) Staff
Theory and principles of security analysis and portfolio management, including analysis of the national economy, industry, company, and security markets. Risk–reward and computer-aided analysis. (Fall and spring)

124 **Advanced Financial Management** (3) Staff
Analysis and readings covering applications of theory to financial management. Case studies for decision making involving working capital, capital budgeting, financing, dividend policy, and valuation. Prerequisite: Fina 122, 123. (Fall and spring)

132 **Real Estate Investment** (3) Staff
Principles of real estate investment, including valuation, appraisal, financing, and development, in addition to a discussion of the mortgage market and its institutions. (Fall)

135 **Money and Capital Markets** (3) Agca
The process of capital formation in a free enterprise economy, with special emphasis on factors affecting the level and structure of interest rates. Money market, capital market, and derivative contracts (futures and swaps) are evaluated from both investment and financing perspectives. (Fall and spring)

190 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods.

199 **Independent Study** (arr.)
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall and spring)

FINE ARTS AND ART HISTORY

Professors L.F. Robinson J.F. Wright, Jr., T. Ozdogan, M.P. Lader, J.C. Anderson (*Chair*), B. von Barghahn, D. Bjelajac
Associate Professors J.L. Stephanic, K.J. Hartswick, P. Jacks
Assistant Professors T. Brown, C. Spangler, E. Speck, D. Kessmann
Associate Professorial Lecturer L.D. Miller
Assistant Professorial Lecturers C. Wilson, S. Francoeur, S. Hutchison

Bachelor of Arts with a major in art history—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in related areas—Fren 4, Ger 4, Ital 4, or Span 4.
3. Required courses in the major—AH 71; 101 or 102; 104 or 105; 106 or 107; 109 or 110; 113 or 114; 117 or 118; 129; 148 or 149; 6 credit hours of AH 198; and 6 additional credit hours in 100-level art history courses, for a total of 39 hours.

Bachelor of Arts with a major in fine arts—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. A total of 51 hours of art courses is required of fine arts majors except for students with a concentration in photography, ceramics, and visual communication, for whom 54 hours are required.
3. Required basic fine arts courses: FA 21–22 and 41–42.
4. Required courses in art history: AH 31–32; 6 additional credit hours in 100-level art history courses.
5. Required fine arts courses in the major:
   a. 12 hours, exclusive of primary area of concentration, in four of the following nine areas—ceramics, advanced drawing, advanced design, interior design, printmaking, painting, photography, sculpture, and visual communication.
   b. 15 hours to be taken in the primary area of concentration (except for photography, ceramics, and visual communication).
   c. 21 hours for students concentrating in photography: FA 23, 24, 25, 123 or 124, 181, 183 or 198, 205.
   d. 21 hours for students concentrating in ceramics: FA 51, 52, 123 or 124, 133, 151, 152, 168.
   e. 21 hours for students concentrating in visual communication: FA 163, 164, and five courses chosen in consultation with the advisor.
   f. Students concentrating in interior design must consult with the area advisor for selection of courses.
6. Nine additional hours of electives may be taken in the Department of Fine Arts and Art History, except for students concentrating in photography, ceramics, and visual communication, who may take 6 hours of electives in the department.
7. Transfer students must take a minimum of 12 credit hours of 100-level fine arts courses at this University, of which 9 hours must be in their area of specialization.

Bachelor of Fine Arts with a major in interior design—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. A total of 120 credit hours, with 75 hours in the department and 45 hours of non-art courses.
3. Required foundation fine arts courses: FA 21–22, 42, 193.
4. Required art history courses: AH 31–32, 169–70.
5. Required fine arts courses in interior design:
   a. FA 108, 109, 110, 113, 114, 117, 118, 119, 122, 130, 139.
   b. 9 hours selected from FA 111, 112, 115, 116, 120, 121, 129.
6. 9 hours selected from course work in ceramics, advanced drawing, advanced design, printmaking, painting, photography, sculpture, visual communication (each course must be in a different area).

Bachelor of Arts with a combined major in art history and fine arts—The following requirements must be fulfilled in consultation with the departmental advisor:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. A total of 30 hours in art history and 30 hours in fine arts.

a. Art history: AH 31–32, 71, and one course in each of the following areas—ancient, medieval, Renaissance, seventeenth or eighteenth century, nineteenth or twentieth century; 6 hours of art history electives.

b. Fine arts: FA 21–22, 41–42. The remaining 18 hours may be in one area of concentration or a combination of areas.

Five-Year Bachelor of Arts with a major in fine arts/Master of Arts in the field of art therapy—Students interested in this dual degree program should consult the director of the Art Therapy Program early in the junior year.

Special Honors—For graduation with Special Honors, students must have attained, by the end of the junior year, a grade-point average of at least 3.5 in the major and 3.0 overall. No later than the beginning of the senior year, students should consult their advisor regarding eligibility and selection of an area of study and a director of the research or creative arts project.

Minor in art history—Required: AH 31, 32 and 12 additional credit hours in 100-level art history courses for a total of 18 hours.

Minor in fine arts—Required: 18 credit hours of general course work in fine arts or in an area of concentration selected from design, drawing, ceramics, interior design, photography, painting, printmaking, sculpture, or visual communication. Students in the general program should consult the undergraduate fine arts advisor. Those selecting a specific area should consult with an advisor in the area of concentration.

Combined minor in art history and fine arts—Required: 9–12 hours of course work in art history and 9–12 hours in fine arts, for a total of 21 hours. A program of study is developed in consultation with the undergraduate advisors in art history and fine arts.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

ART HISTORY

31–32 Survey of Western Art (3–3) Staff
A foundation for further study in the history of art. Art 31: prehistoric to Gothic art. Art 32: proto-Renaissance to modern art. (Art 31 and 32—fall and spring)

71 Introduction to the Arts in America (3) Bjelajac
A survey of American art from the period of colonial exploration and settlement to the postmodern present. Political and social meanings of painting, sculpture, architecture, prints, and photographs. The relationship of art to religion and nationalism; issues of class, race, and gender. (Fall)

101 Ancient Art of the Bronze Age and Greece (3) Hartswick
A survey of Greek art from the Minoans and Mycenaeans (c. 2000 B.C.) to the age of Alexander (c. 300 B.C.). Relationships among the arts of the different groups in the Aegean area and their impact on Western culture. The Theran volcanic eruption, the "Dorian Invasion," the portrayal of women, "heroic nudity," and the assumption of a stylistic chronology. (Fall)

102 Ancient Art of the Roman Empire (3) Hartswick
A survey of Roman art from the successors of Alexander the Great (c. 300 B.C.) to the fall of the Roman Empire in the West (c. 300 A.D.). The impact of the Greek world on Roman art and culture; innovations and achievements of the Romans in architecture, portraiture, and historical narrative. Focus on the city of Rome and other areas of the Roman world such as North Africa and Asia. (Spring)

104 Italian Art of the 13th–15th Centuries (3) Jacks
Origins, development, and theoretical foundations of Renaissance painting, sculpture, and architecture (Glotto, Duccio, Masaccio, Donatello, Ghiberti, Brunelleschi, Mantegna, Bellini, Botticelli). (Fall)

105 Italian Art and Architecture of the 16th Century (3) Jacks
The development of the universal genius within the circle of Florence and Rome (Leonardo, Raphael, Michelangelo) and their counterparts in Venice (Giorgione, Titian, Tintoretto, Sansovino, Palladio). (Spring)

106 Northern Renaissance Art I (3) von Barghahn
The 15th century: Flemish masters van Eyck, Campin, van der Weyden, Christus, Bouts, van der Goes, Memling, and David. Valois king Charles I and patronage

by the dukes of Anjou, Berry, Orleans, and Burgundy. The late 15th-century French masters influenced by Flanders. (Fall)

107 **Northern Renaissance Art II** (3) von Barghahn
The 16th century: German masters Durer, Grunewald, Altdorfer, Grien, Cranach, and Holbein; the patronage of Maximilian I. Netherlandish masters Massys, Patiner, and Pieter Brueghel. French style at the courts of Francis I, Henri II, and Charles IX. (Spring)

108 **18th-Century Art in Europe** (3) Bjelajac
Painting, sculpture, and architecture in France, Great Britain, and Italy. Emphasis on Watteau, Chardin, David, Hogarth, Gainsborough, Reynolds, Canaletto, and Tiepolo. (Spring)

109 **European Art of the Early 19th Century** (3) Robinson
Examination of Neoclassicism and Romanticism in the context of Western European political, social, and cultural developments. Emphasis on France, England, and Germany and the representative styles of David, Ingres, Delacroix, Turner, Constable, and Friedrich. (Fall)

110 **European Art of the Late 19th Century** (3) Robinson
Examination of the revolution in style of Realism, Impressionism, and Post-Impressionism in the context of Western European political, social, and cultural developments. Emphasis on representative styles of Courbet, Manet, Monet, Morisot, Degas, Seurat, Cezanne, Van Gogh, and Gauguin. (Spring)

111 **Classical Archaeology** (3) Hartswick and Staff
Archaeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.

112 **Egypt and the Near East** (3) Hartswick and Staff
The great artistic tradition of the Nile Valley and the contemporary civilizations (ca. 3000 B.C. to after 1000 B.C.) between the rivers Tigris and Euphrates (present day Iraq) are explored. Emphasis on the Pyramid Age, the temples at Karnak and Luxor, the tombs of the Valley of the Kings, and the artistic traditions of the Sumerians, Akkadians, Babylonians, Assyrians, and Persians. (Fall)

113 **Italian Art and Architecture of the 17th Century** (3) Jacks
The Counter-Reformation and creation of the Baroque in painting, sculpture, and architecture in Rome (Carracci, Caravaggio, Bernini, Borromini, Pietro da Cortona), Turin (Guarini, Juvarra), and Venice (Longhena). (Spring)

114 **Flemish, Dutch, and English Baroque Art** (3) von Barghahn
Hapsburg Flanders and Brussels under the Spanish archdukes and their patronage of Rubens and his circle. The role of Dutch merchants commissioning diverse secular themes in Utrech, Harlem, Delft, Leyden, and Amsterdam from "Golden Age" artists such as Rembrandt, Vermeer, and Hals. (Fall)

117 **Medieval Art I** (3) Anderson
Early Christian and Byzantine. (Fall)

118 **Medieval Art II** (3) Anderson
Romanesque and Gothic. (Spring)

119 **Islamic Religion and Art** (3) Nasr
Same as Rel 163.

121 **Spanish Art I** (3) von Barghahn
Discussion of areas selected from the art of the fourteenth through the seventeenth centuries. Specific topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the content differs.

122 **Spanish Art II** (3) von Barghahn
Discussion of areas selected from the seventeenth through nineteenth centuries. Specific topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the content differs.

129 **20th-Century Art in Europe** (3) Lader
Survey of 20th-century European painting, sculpture, and architecture, from their origins in the late 19th century through Surrealism. Emphasis on theory. Includes artists such as Matisse, Picasso, Kandinsky, Duchamp, and Mondrian. Prerequisite: AH 32 or 110. (Fall)

130 **20th-Century Art in America** (3) Lader
Survey of 20th-century American painting and sculpture from the turn of the century to the beginnings of postmodernism with focus on the avant garde. Emphasis on artists of the Stieglitz circle and later modernist movements such as

Abstract Expressionism, Pop, Op, Minimal, and Conceptual art. Includes theory and criticism. Prerequisite: AH 71, 110, or 129.

131 **Modernist and Postmodernist Art and Theory** (3) Lader
Artists, art forms, and critical concepts from the 1940s to the present, focusing on Clement Greenberg's modernist theory and the development of postmodernist art and thought. Prerequisite: Art 129 or 130. (Spring)

145 **Folk Arts in America** (3) Staff
Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts. Same as AmSt 145.

147 **Latin American Art** (3) von Barghahn
Ancient civilizations through modern. Specific topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

148 **American Art I: Age of Revolution** (3) Bjelajac
Examination of American art during the 18th-century "consumer revolution," the American War for Independence, and the early republic. Emphasis on the socioeconomic and political purposes of art, with focus on Enlightenment symbolism and the visualization of national identity.

149 **American Art II: Era of National Expansion** (3) Bjelajac
Examination of American art from the opening of the Erie Canal in 1825 to the Spanish-American War in 1898. Emphasis on the role of art in the expansion of the United States, exploring issues of race, class, and gender; art and religion.

150 **Internship in Art History** (3) Staff
Open to candidates for the B.A. in art history only and with the approval of advisor in art history. May not be repeated for credit toward the degree. May be taken *P/NP* only.

155 **Aegean Civilizations** (3) Hartswick
An introduction to the excavational and multidisciplinary aspects of classical archaeology. Minoan and Mycenaean civilizations (1700–1200 B.C.). Interrelationships between Greek and Persian cultures of the sixth and fifth centuries B.C.

161 **Studies in Renaissance Art** (3) Staff

162 **Principles of Museum Work** (3) Staff
Introduction to the history and development of museums; problems of museum administration, connoisseurship, cataloguing, installation, conservation, and educational service.

169 **History of Decorative Arts: European Heritage** (3) Staff
Survey of changing styles of European furniture, textiles, ceramics, and glass, in the context of general trends in art history and changing patterns in economic, technological, social, and cultural history. From antiquity to the modern age. (Spring)

170 **History of Decorative Arts: American Heritage** (3) Staff
Examination of the decorative arts in America from the 17th century to the modern period. Exploration of changing visual characteristics in relation to the changing American experience. (Fall)

173 **History of the Cinema** (3) Staff
Same as EMda 173. Laboratory fee, $35.

176 **American Architecture** (3) Longstreth
Same as AmSt 175.

177 **Modern Architecture: Europe and America, 1750–2000** (3) Jacks
Major developments in architecture and urbanism from the Industrial Revolution to the end of the 20th century. (Spring)

187 **East Asian Art** (3) Staff
Survey of the arts of China, Japan, and Korea.

188 **South Asian Art** (3) Staff
Survey of the arts of India, Pakistan, Sri Lanka, Nepal, and Tibet, from prehistoric times to circa 18th century.

191 **American Architecture** (3) Longstreth
Same as AmSt 176.

192 **The American Cinema** (3) Staff
Same as AmSt 192.

193 **Archaeology of Israel and Neighboring Lands** (3) Cline
Same as Anth 188.

195 **Independent Study** (1 to 3) Staff
Directed research and study in a specific area of art history to be approved by a faculty member. May be repeated for credit.

197 **History of Photography** (3) Lader

198 **Studies in Art History: Special Topics** (3) Staff
The historiography of art (readings in literature of art history from the Renaissance to the present) as well as other topics from ancient to contemporary art. Open to junior and senior art history majors; open to nonmajors by permission of instructor. May be repeated for credit provided the topic differs.

FINE ARTS

Note: Fine arts courses at the 100 level may be repeated for credit with approval of the department. Schedule of fees for FA 123–24: Ceramics—$105; 2-D Design—$24; 3-D Design—$27; Drawing—$75; Printmaking—$54; Sculpture—$85; Typography—$75; Oil and Acrylic Painting—none; Watercolor—$45; Photography—$100; Visual Communication—$100; Interior Design—$100; Lithography—$54; Serigraphy—$75; Jewelry Design—$85; Bookbinding—$51.

21–22 **Design I: Basic** (3–3) Stephanic and Staff
Required of all Fine Arts majors. Fundamental studies of principles and elements of design. FA 21: study of two-dimensional design. FA 22: three-dimensional studies. FA 21: Laboratory fee, $24. FA 22: Laboratory fee, $27. (FA 21 and 22—fall and spring)

23 **Introduction to Photography** (3) Kessmann and Staff
Introduction to the principles of exposure and development of films and papers. Emphasis on creative expression. Laboratory fee, $100. (Fall and spring)

24 **Introduction to Color Photography** (3) Kessmann and Staff
Introduction to the materials and processes of color photography. Emphasis on the proper exposure and color balancing of slide film for the purpose of creative expression. Prerequisite: FA 23 or permission of instructor. Laboratory fee, $100. (Fall and spring)

25 **Digital Photography** (3) Kessmann and Staff
Introduction to the digital-editing program Adobe Photoshop. Emphasis on the features most useful to photographic artists for the purpose of creative expression. Prerequisite: FA 24 or permission of instructor. Laboratory fee, $100. (Fall and spring)

41–42 **Drawing I** (3–3) Wright and Staff
Elementary investigation of concepts of drawing, both traditional and contemporary; training in perception, analysis of form in light and space; instruction in the use of graphic materials and media; exercises in connoisseurship. Material and model fee, $75 per semester. (FA 41 and 42—fall and spring)

51 **Introduction to Handbuilt Ceramics** (3) Ozdogan and Staff
Working with clay as an art form. Exploration of pinch, coil, slab, hump and press mold, paddling, and hollowing techniques. Sketch studies, reduction and oxidation kiln firings, clay and glaze making. Laboratory fee, $105, includes unlimited materials and use of tools. (Fall and spring)

52 **Introduction to Wheelthrown Ceramics** (3) Ozdogan and Staff
Development of cylindrical and open forms. Trimming, clay and glaze making, reduction and oxidation kiln firings. Sketch studies. Laboratory fee, $105, including unlimited materials and use of tools. (Fall and spring)

61–62 **Water Color** (3–3) Staff
Painting in transparent and opaque water color and in acrylic. Experimentation, figurative, and landscape. Laboratory fee, $45 per semester. (Academic year)

65–66 **Painting I** (3–3) Staff
Focus on fundamental technical and perceptual skills. Working with oils, assignments are based directly from life. Material and model fee, $45 per semester. (Academic year)

81–82 **Sculpture I** (3–3) Staff
Beginning study of design and fabrication of sculpture. Basic sculptural techniques for media, including clay, plaster, stone, and wood. Laboratory fee, $85 per semester. (Academic year)

108 **Architectural Drawing** (3) Staff
Basic graphic communication skills appropriate to the development of interior design projects. Two- and three-dimensional drawing skills developed through

use of sketching, orthographic drawing, paraline drawing, and perspective techniques. Prerequisite: FA 42. Laboratory fee, $100.

109 **Interior Design Studio I** (3) Staff
Application of basic design concepts and introduction to the design process. Development of floor plans and elevations, furniture layouts, perspective drawings, and presentation boards for residential and commercial design. Prerequisite: FA 108. Laboratory fee, $100.

110 **Textiles and Finish Materials** (3) Staff
Textiles and finish materials for commercial and residential interiors. Physical properties, application, testing, regulations, and specification. Laboratory fee, $100.

111 **Furniture Design** (3) Staff
Principles and components of furniture design, both functional and aesthetic. Emphasis on construction, design, detailing of cabinetry and millwork. Development of design and technical skills. Two- and three-dimensional drawing models. Prerequisite: FA 109. Laboratory fee, $100.

112 **Computer-Aided Drafting for Interiors** (3) Staff
Introduction to basic CAD commands, two- and three-dimensional drawings, enhancement, and plotting. Using CAD as a tool to extend the design process. Prerequisite: FA 193. Laboratory fee, $100.

113 **Interior Design Studio II** (3) Staff
Residential interior design: single-family and multi-unit. Application of residential building technology, code requirements, and barrier-free design. Custom millwork and cabinetry design. Prerequisite: FA 109. Laboratory fee, $100.

114 **Interior Design Studio III** (3) Staff
Commercial interior design: office, restaurant, and retail. Application of building codes and ADA requirements. Layout and specification of contract and systems furniture. Commercial textiles and finish materials. Prerequisite: FA 113. Laboratory fee, $100.

115 **Studio in Historic Interiors** (3) Staff
Exploration and interpretation of significant periods of interior design through the study of historic furniture, decorative art, and architecture. Focus on application of historic styles for restoration or adaptive use. Prerequisite: AH 169 and 170. Laboratory fee, $100.

116 **Textile Design and Construction** (3) Staff
Design and construction of various types of textiles, both woven and non-woven. Emphasis on the creative process and design development. Prerequisite: FA 21. Laboratory fee, $100.

117 **Methods and Materials of Building Construction** (3) Staff
Study of building systems as they relate to design and function of interior spaces: mechanical, electrical, HVAC systems. Environmental concerns: energy, daylighting, and acoustics. Prerequisite: FA 108 and 110. Laboratory fee, $100.

118 **Interior Design Studio IV** (3) Staff
Application of theories of human behavior and design in large-scale institutional settings, including public and private facilities serving medical, educational, and extended-care needs. Prerequisite: FA 114. Laboratory fee. $100.

119 **Lighting Design** (3) Staff
Study of basic terminology, concepts, and principles of lighting design. Study of light and energy, incandescent and gaseous discharge lamps, luminaries, task requirements, measurement and calculation, human factors, and design applications for lighting. Prerequisite: FA 108. Laboratory fee, $100.

120 **Design of Printed Textiles** (3) Staff
Surface pattern design of textiles. Source materials, design techniques, and development of technical skills. Prerequisite: FA 21. Laboratory fee, $100.

121 **Environment and Behavior** (3) Staff
Study of interior design as it relates to the built environment and its effect on human behavior. Interior space as stage for social interaction. Evaluation of interior spaces using standard research methodology. Laboratory fee, $100.

122 **Contemporary Issues in Interior Design Theory and Practice** (3) Staff
The roles and responsibilities of interior designers in the context of current social and technical forces. Topics include business procedure and practice, legal and ethical issues, and designer–client–contractor relations. Prerequisite: FA 108 and 110.

123–24 **Individual Problems** (1 to 6 each) Staff
Emphasis on problems and materials of specific interest to the student in any area of fine arts. Laboratory fee depending on area chosen. Prerequisite: permission of instructor.

125–26 **Painting II** (3–3) Staff
Work in oil from still lifes, landscapes, and figures to pursue challenges including color, gesture, light and paint quality. Material and model fee, $45 per semester. (Academic year)

127–28 **Painting III** (3–3) Woodward
Studies in the interpretation of the figure and still life. Emphasis on color, space, planes, modulations. Alla prima and mixed techniques. Material and model fee, $45 per semester. (Academic year)

129 **Presentation Techniques** (3) Staff
Advanced three-dimensional drawing using rapid visualization techniques, sketching, and constructed drawings. Development of multimedia rendering techniques. Prerequisite: FA 109. Laboratory fee, $100.

130 **Internship in Interior Design** (3) Staff
Application of knowledge and skills in project-based setting for a local firm. Appropriate placement and sponsor participation required prior to registration. Prerequisite: FA 114 and senior standing.

131 **Intermediate Ceramics: Wheelthrown Functional Forms** (3) Ozdogan and Staff
Aesthetic and technical development of wheelthrown functional ceramic forms. Exploration of attachments: lids, spouts, handles, and footing devices. Sketches and technical drawings, clay and glaze-making tests, varied temperature firings in reduction and oxidation atmospheres. Laboratory fee, $105. (Fall and spring)

132 **Intermediate Ceramics: Wheelthrown Nonfunctional Forms** (3) Ozdogan and Staff
Aesthetic and technical development of wheelthrown ceramic sculptural forms. Emphasis on section throwing, closed forms, and construction. Varied temperature firings in oxidation and reduction atmospheres. Clay and glaze making. Laboratory fee, $105. (Fall and spring)

133 **Ceramic Decoration** (3) Ozdogan
Aesthetic and technical development of surface decoration, with experimental projects in sgraffito, mishima, engobe, majolica, underglaze, overglaze, and relief techniques. Laboratory fee, $105.

134 **Nonsilver Printing Processes in Photography** (3) Staff
Introduction to nonsilver and archaic photographic processes. At least three processes will be explored. Emphasis on creative expression. Prerequisite: FA 23 and 24 or permission of instructor. Laboratory fee, $100. (Spring)

135 **Advanced Water Color** (3) Staff
Development of techniques of water color; concentration on special projects. Laboratory fee, $45. (Academic year)

139 **Problems in Color** (3) Staff
Intensive exploration of the objective rationale and subjective experience of color through the execution of problems in color contrast and color scales. Prerequisite: FA 21. Laboratory fee, $18. (Spring)

141 **Interior Design** (3) Staff
Survey of basic interior design materials and techniques. Topics include floor plans and design, interior renderings, hard and soft materials, furniture styles. Laboratory fee, $21. (Fall)

142 **Interior Design Problems** (3) Staff
A theoretical and practical in-depth exploration of a specific area of interior design. Topic to be announced in the *Schedule of Classes*. Prerequisite: FA 141 or equivalent. Laboratory fee, $35. (Spring)

143–44 **Printmaking: Screenprinting** (3–3) Staff
Fine arts printmaking using serigraphic techniques. Utilization of all basic techniques; emphasis on aesthetic properties of prints. Laboratory fee, $75 per semester. (Academic year)

146 **Ceramic Restoration, Conservation, and Installation** (3) Ozdogan
Methods and techniques of restoration, conservation, and installation of pottery, sculptural ceramics, and architectural ceramics, with modular and mixed

media attachments. Emphasis on repair according to museum and collector specifications, using permanent and temporary finishings. Laboratory fee, $105. (Summer)

151 **Ceramic History and Technology** (3) Staff
Emphasis on clay and glaze formulation and firing techniques, with related historical background. Laboratory fee, $105. (Fall)

152 **Ceramic Sculpture** (3) Ozdogan
Developing an understanding of the sculptural ceramic form that integrates both quality and creativity. Techniques in hollow and solid construction. Varied temperature firings in reduction and oxidation atmospheres. Laboratory fee, $105. (Fall)

159–60 **Drawing II** (3–3) Wright and Staff
Study and application of master drawing techniques. Investigation of perspective and anatomy. Emphasis upon conceptual development of personal style. Material and model fee, $75 per semester. (Academic year)

163 **Visual Communication I: Basic Layout** (3) Staff
Layout stages, including basic formats, production processes; working with type and basic skills. Prerequisite: FA 171. Laboratory fee, $100.

164 **Visual Communication II: Problem Solving** (3) Staff
Conceptual approach to problem solving. Various graphic design problems, including both small-format and large-format design in commercial and institutional graphics. Prerequisite: FA 163, 172. Laboratory fee, $100.

166 **Advanced Drawing Techniques** (3) Staff
Specific area announced in the *Schedule of Classes*. May be repeated for credit if the area covered is different. Laboratory fee: FA 166.10, $75; FA 166.11, $90.

168 **Intermediate Ceramic Design in Handbuilding** (3) Ozdogan
Further concentration in handbuilding techniques of pinch, coil, slab, hump and press mold, paddling, and hollowing. Sketch studies, clay and glaze tests. Orientation to studio operations and maintenance. Laboratory fee, $105. (Fall and spring)

171 **Typography I** (3) Staff
Basic calligraphy for traditional and contemporary use. Type theory, including specification, copy fitting, and study of letter form as used in graphic design. Laboratory fee, $100.

172 **Typography II** (3) Staff
Study of type classification, recognition, and adaptation. Methods of type specification, copy fitting, and typesetting processes. Typographic layout and alphabet design. Prerequisite: FA 171. Laboratory fee, $100.

174 **Visual Communication III: Computer Graphics** (3) Staff
Introduction to computer graphics in visual communication. The use of computers in the design process and as a tool for problem solving in graphic design. Laboratory fee, $100.

179–80 **Sculpture II** (3–3) Staff
Expansion of Sculpture I, utilizing advanced wood milling equipment and metal welding techniques. Prerequisite: FA 81–82. Laboratory fee, $85 per semester.

181 **Criticizing Photographs** (3) Kessmann and Staff
Introduction to photographic theory and the process of art criticism with an emphasis on photographic images. Laboratory fee, $100. (Fall)

182 **Introduction to Photographic Lighting** (3) Kessmann and Staff
Introduction to various lighting techniques. Available light manipulation, studio lighting, and copy lighting will be explored. Emphasis on creative expression. Prerequisite: FA 23 and 24 or permission of instructor. Laboratory fee, $100. (Fall and spring)

183 **Experimental Photography** (3) Kessmann and Staff
Structured exploration of various photographic processes and techniques. Emphasis on creative expression. Content of course will vary; contact department for current offering. Prerequisite: FA 23 and 24 or permission of instructor. Laboratory fee, $100. (Fall and spring)

186 **Portrait Painting and Drawing** (3) Staff
Model fee, $45.

189–90 **Sculpture III** (3–3) Staff
Advanced study in concepts and materials through creation of three-dimensional forms concentrating on relevance of scale and media. Relationship of sculpture to the environment. Prerequisite: FA 179–80. Laboratory fee, $85 per semester. (Academic year)

193 **Computer Design in the Fine Arts I** (3) Stephanic
Exploration of the use of computers as a visual arts medium. Topics include bit-mapped painting, object-oriented drawing, Image scanning/manipulation, multimedia and Internet site design. Emphasis on creative expression. Laboratory fee, $100.

194 **Computer Design in the Fine Arts II** (3) Stephanic
Continuation of FA 193, with an emphasis on individual approach. Prerequisite: FA 193 or permission of instructor. Laboratory fee, $100.

198 **Topics in Photography** (3) Kessmann and Staff
Structured exploration of various topics related to photographic practice. May be repeated for credit provided the topic differs. Prerequisite: FA 23 or permission of instructor. Laboratory fee, $100.

FORENSIC SCIENCES

The Department of Forensic Sciences offers graduate degree programs through Columbian College of Arts and Sciences. The following courses are available to undergraduates.

103–4 **Introduction to Forensic Sciences** (3–3) Rowe
Topics in the application of science to the criminal justice system, including personal identification, analysis of drugs, forms of trace evidence, identification of biological fluids, forensic pathology, and forensic toxicology. Laboratory exercises. Prerequisite: two semesters of a laboratory science other than astronomy.

190 **Topics in Forensic Sciences** (3) Staff
Prerequisite: Any combination of two courses from BiSc 3–4 or Chem 3–4 or equivalent and junior standing.

FRENCH

See **Romance Languages and Literatures.**

GEOGRAPHY

Professor G.C. Stephens
Associate Professors M.D. Price (*Chair*), E. Chacko
Assistant Professors I. Cheung, L.M. Benton-Short, D. Rain
Professorial Lecturer G.T. Foggin
Assistant Professorial Lecturers L. Marcus, M. Zeigler, P. Solis

Bachelor of Arts with a major in geography—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in the major—36 credit hours, including Geog 1, 2, 195. A minimum of 6 credit hours must be chosen from each of the following groups: Group A (Physical/Environmental/Resources)—Geog 108, 110, 128, 132, 134, 136, 137, 143; Group B (Human)—Geog 124, 125, 127, 133, 140, 141, 143, 144, 145, 146, 147, 187; Group C (Techniques)—Geog 104, 105, 106, 107, 121. At least 3 credits must be chosen from Group D (Regional)—Geog 120, 151, 154, 161, 164, 165.

Minor in geography—Required: 21 credit hours, including Geog 1, 2, and one course from each of the groups listed under requirements for the major.

Minor in geographic information systems—Required: 21 credit hours, including Geog 1, 2; four courses from Group C and one course from either Group A or B, above.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

1 **Introduction to Human Geography** (3) Benton-Short, Chacko
A systematic survey of human geography; cultural perspectives on the use of space, including urbanization, geopolitics, and land use. (Fall and spring)

2 **Introduction to Physical Geography** (3) Foggin, Stephens
A systematic survey of environmental geography; perspectives on environments and human ecology, including ecosystems and their use, human population dynamics, and resource geography. (Fall and spring)

104 **Introduction to Cartography and GIS** (3) Staff
Fundamentals of cartography; geographic data structure and information systems. Laboratory fee, $55.

105 **Techniques of Spatial Analysis** (3) Cheung
Nature of geographical inquiry and analytical methods used in the study of spatial processes and patterns.

106 **Intermediate Geographic Information Systems** (3) Cheung, Rain
Principles of geographic information systems and their use in spatial analysis and information management. Laboratory fee, $55. Prerequisite: Geog 104 and 105.

107 **Introduction to Remote Sensing** (3) Staff
Remote-sensing techniques using digital satellite imagery and aerial photography. Application to rural and urban settings, archaeology, and environmental monitoring. Laboratory fee, $55. Prerequisite: Geog 105 or permission of instructor.

108 **Weather and Climate** (3) Cheung
The elements and controls of weather and climate. Topics include energy and water balances, atmospheric general circulation, and severe weather events. Laboratory fee, $55. Prerequisite: Geog 2.

110 **Climate and Human Ecology** (3) Cheung
Interrelationships between human activities and the climatic environment. Emphasis on global climatic change. Prerequisite: Geog 2.

120 **World Regional Geography** (3) Price
World cultural regions and the impacts of globalization; the environmental human conditions that undergird current problems and future prospects.

121 **Advanced Geographic Information Systems (GIS)** (3) Cheung
Integration of GIS, remote sensing, and spatial modeling. Laboratory fee, $55. Prerequisite: Geog 106.

124 **Urban Transportation** (3) Marcus
The relationship between freight and passenger transportation systems and urban land use patterns and structure. Prerequisite: Geog 1.

125 **Transportation and Communication** (3) Marcus
The structure and evolution of transportation and communication networks and their impact on regional development. Prerequisite: Geog 1.

127 **Population Geography** (3) Chacko
Patterns of world population; factors contributing to population pressures, growth, and migrations.

128 **Geomorphology** (4) Stephens
Same as EES 128.

132 **Environmental Quality and Management** (3) Foggin
The evolution of environmental management philosophies and tools. The global distribution, utilization, and degradation of natural resources. Prerequisite: Geog 2.

133 **People, Land, and Food** (3) Foggin
Domestication and dispersal of plants and animals; development of agricultural systems; spatial disparities in world food production, demand, and distribution.

134 **Energy Resources** (3) Staff
Analysis of regional patterns and trends in consumption and production of energy resources. Examination of international energy linkages and energy policies of selected nations. Prerequisite: Geog 2.

136 **Water Resources** (3) Foggin
Analysis of the global spatial patterns, development, use, and quality of water resources.

137 **Environmental Hazards** (3) Cheung
Examination of environmental hazards with emphasis on the use of geographic information systems. Prerequisite: Geog 2.

140 **Urban Geography** (3) Benton-Short
Analysis of the internal spatial structure of cities; emphasis on patterns and dynamics of location within cities in the developed world. Prerequisite: Geog 1.

141 **Cities in the Developing World** (3) Rain
Urbanization processes, problems, and management in the developing world. Focus on urban location, politics, housing, services, employment, and environmental issues. Prerequisite: Geog 1.

143 **Urban Environmental Geography** (3) Benton-Short
Relationship between urban spaces and the environment. Prerequisite: Geog 1.

144 **Explorations in Historical Geography** (3) Staff
Same as AmSt 144.

145 **Cultural Geography** (3) Staff
Analysis of the relationships between culture and environment; emphasis on spatial and ecological considerations. Prerequisite: Geog 1.

146 **Political Geography** (3) Price and Staff
Interrelationships among the human and physical environment and political systems; the organization of political territories.

147 **Military Geography** (3) Staff
An examination of environmental and locational factors and their impact on military planning and operations.

151 **Geography of North America** (3) Foggin
An examination of the environmental, social, and economic factors that have led to development of the several regions of the U.S. and Canada.

154 **Geography of the Middle East and North Africa** (3) Staff
Cultural and physical regional patterns of the Middle East and North Africa. Prerequisite: Geog 1 or 2.

161 **Geography of Latin America** (3) Price
Examination of spatial characteristics of physical and cultural phenomena in Latin America.

164 **Geography of Africa** (3) Rain
Cultural and physical patterns of Africa. Prerequisite: Geog 1 or 2.

165 **Geography of South Asia** (3) Chacko
An examination of the complex interplay of environmental, economic, sociocultural, and political factors in South Asia and their effects at the local and regional levels.

187 **Building Cities** (3) Staff
Urban development dynamics and experience in the United States and abroad, including the pressures of social change. Background and insights needed by entrepreneurs and enlightened citizens to comprehend and play effective roles in contemporary city-building. Same as AmSt 187.

189–90 **Readings in Geography** (arr.) Staff
Prerequisite: 12 credit hours of geography and permission of instructor.

195 **Proseminar in Geographic Thought** (3) Foggin
For students completing the major in geography. Development of geographic thought, theories, and methodologies; geographic curricula. Prerequisite: permission of the advisor.

198 **Special Topics** (3) Staff
Consideration of geographic aspects of topical and future problems of society. May be repeated for credit provided that the topic differs. Prerequisite: Geog 1 or 2.

199 **Internship** (3) Staff
Fieldwork, internship, or other controlled assignment with an agency or organization engaged in work in applied geography. Prerequisite: 12 credit hours of geography courses and permission of instructor.

GEOSCIENCE

See **Earth and Environmental Sciences.**

GERMAN AND SLAVIC LANGUAGES AND LITERATURES

Associate Professors R. Robin, P. Rollberg, M.R. Gonglewski, M.B. Stein
Assistant Professors J. Heins, G. Shatalina, H. Franz
Assistant Professorial Lecturers B.M. Pollack, L. Guslistova, E. Ovtcharenko

Bachelor of Arts with a major in German language and literature—The following requirements must be fulfilled.

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Ger 5–6 (or Ger 1–2, 3–4).
3. Required courses in the major—Ger 9–10, 109–10; two courses chosen from Ger 91–92 or 161–62; two courses chosen from Ger 111, 161–62 (if not taken above), 165, or the 180s series; four courses chosen from the Ger 170s series.

Bachelor of Arts with a major in Russian language and literature—The following requirements must be fulfilled.

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Slav 5–6 (or Slav 1–2, 3–4) and Slav 91–92.
3. Required courses in the major—Slav 9–10, 109–10, 161, and 162; two courses chosen from Slav 171, 172, 173, 174; two courses chosen from Slav 165, 166, 185, 186.

Proficiency requirements for the Russian major. By the end of Slav 11, students consult their advisor to choose one of two proficiency tracks: (1) Emphasis on proficiency in speaking. Students choosing this track must attain speaking proficiency at the Intermediate High level, as measured by the ACTFL Oral Proficiency Interview. A semester of intensive language study in Russia on an approved program is required unless waived by the department. (2) Emphasis on proficiency in reading. Students choosing this track must attain reading proficiency at the Advanced level on the ACTFL scale, as measured by a departmental examination. Slav 101–102 is required, unless waived by the Department.

Special Honors in German or Russian Language and Literature—In addition to the general requirements stated under University Regulations, a candidate for special honors must have attained a 3.5 grade-point average in the major and at least a 3.0 average overall. Students must apply for honors candidacy by the end of the first semester of the junior year, must attain speaking proficiency at the Advanced level, as measured by the ACTFL Oral Proficiency Interview, and must successfully complete an honors thesis (Ger or Slav 197–98).

Minor in German language and literature—Ger 1–2, 3–4 (or 5–6); Ger 9–10 (or 101–2); two courses chosen from Ger 91–92, 109–10, or 161–62; two additional 100-level courses chosen from the German Language and Literature listing below (excluding Ger 101–2).

Minor in Russian language and literature—Slav 1–2 and 3–4 (or 5–6), 9–10 (or 101–2), and four courses chosen from Slav 91–92, 161, 162, 165, 166, 171, 172, 173, 174, 185, 186.

Note: Completion of Ger 109 or 110 is prerequisite to courses in the Ger 170s series.

Placement Examination: A student who wishes to continue in college the language study begun in high school must take a placement examination before registration. Upon completion of the examination, assignment is made to the appropriate course.

GERMAN LANGUAGE AND LITERATURE

1–2 **Basic German** (4–4) Gonglewski and Staff
First part of beginning course in fundamentals of speaking, understanding, reading, and writing German. Prerequisite to Ger 2: Ger 1. Laboratory fee, $50 per semester. (Academic year)

3–4 **Basic German** (4–4) Gonglewski and Staff
Second half of beginning course in fundamentals of speaking, understanding, reading, and writing German. Prerequisite to Ger 3: Ger 2 or equivalent. Prerequisite to Ger 4: Ger 3. Laboratory fee, $50 per semester. (Academic year)

5–6 **Intensive Basic German** (8–8) Gonglewski and Staff
Beginning intensive course in fundamentals of speaking, understanding, reading, and writing German (equivalent to Ger 1–2 and 3–4). Recommended for majors. Prerequisite to Ger 6: Ger 2 or 5 or equivalent. Laboratory fee, $70 per semester. (Academic year)

9–10 **Intermediate German** (3–3) Gonglewski and Staff
Practice in speaking, listening, reading, and writing at the intermediate level. Prerequisite: Ger 4 or 6 or permission of instructor. (Academic year)

91–92 **Introduction to German Literature—in English** (3–3) Heins, Stein
Ger 91: Survey of German literature 1700–1830, including the Enlightenment through *Sturm und Drang*, classicism, and romanticism. Ger 92: Survey of German literature 1830–1950, including Young Germany through realism, natural-

ism, expressionism, and the literature of the Third Reich years (exile literature and inner emigration). (Academic year)

101–2 **Readings in Contemporary German** (3–3) Staff
Analysis of representative readings of expository prose from German newspapers, periodicals, and other publications. Prerequisite: for Ger 101, Ger 4 or 6 or equivalent; for Ger 102, Ger 101. (Academic year)

109–10 **Introduction to German Studies** (3–3) Heins, Stein
An introduction to approaches, concepts, and analytical tools for study in the field, complemented by advanced practice in speaking, listening, reading, and writing. Prerequisite: Ger 10 or permission of instructor. (Academic year)

111 **Business German** (3) Gonglewski
Introductory course preparing students to function in business-related communicative situations, with an emphasis on language skills necessary for work in areas such as marketing and finance. Prerequisite: Ger 10 or permission of instructor. (Spring)

161–62 **German Culture—in English** (3–3) Stein
The central problems, issues, and events that have shaped the development of German culture from antiquity to the present. Emphasis on products and processes of German culture in social, historical, and political contexts. (Academic year)

165 **20th-Century German Literature—in English** (3) Stein
Survey of the major trends in the works by modernist, exile, postwar, and contemporary German writers such as Kafka, Thomas Mann, Duerrenmatt, and Grass. (Fall)

171 **The Age of Goethe—in German** (3) Heins
Readings of major works of Weimar classicism in their historical and cultural context.

172 **From Romanticism to Realism—in German** (3) Heins
Readings in German romanticism, literature of the "young Germany" movement (Heine), and realism (Fontane, Storm).

173 **From Naturalism to Expressionism—in German** (3) Heins, Stein
Study of various literary movements between 1880 and 1914: naturalism, impressionism, symbolism, and expressionism (Hauptmann, Hesse, Thomas Mann, Kafka).

174 **Inside and Outside the Third Reich—in German** (3) Staff
Analysis of literary developments inside the Nazi state (propaganda literature, literature of resistance, and inner immigration) and the literature of exile (Seghers, Remarque).

175 **Literature of Two Germanies—in German** (3) Stein
Evolution of East and West German literatures after World War II, their separate developments and ultimate unification.

181 **History of German Cinema—in English** (3) Rollberg
A detailed historical and cultural survey of German cinema from the first moving picture devices (1895) to the expressionistic classics of the 1920s and the collapse of the Nazi film industry in 1945. All films are subtitled.

182 **The Fairy Tale from the Grimms to Disney—in English** (3) Stein
Survey of the changing form, structure, and meaning of the fairy tale in its traditional contexts, modern transformations and critical interpretations, with readings by 19th-century European collectors and 20th-century critics.

183 **Berlin Before and After the Wall—in English** (3) Stein
The political, social, and cultural developments in Berlin from 1945 to the present through a reading of selected primary documents, historical analyses, and short literary texts.

184 **German Thought—in English** (3) Heins
An overview of German ideas about culture, religion, society, and politics from the 16th century to the present. Readings from such writers as Luther, Leibniz, Kant, Schiller, Hegel, Marx, Nietzsche, Freud, Weber, Heidegger, Adorno, and Habermas.

185 **Literary Voices and the Fascist Experience—in English** (3) Staff
A survey of writers anticipating as well as reflecting on Germany's plunge into the totalitarian abyss of fascist politics, including H. Mann, Kafka, Juenger, Brecht, Werfel, Thomas Mann, Lenz, Frisch, Duerrenmatt, and various forms of Holocaust poetry.

186 **German Women Writers of the 19th and 20th Centuries** (3) Staff
The changing literary and social roles of German women of the 19th and 20th centuries, examined through selected readings of women's literary production and culture.

195 **Special Topics** (3) Staff
Directed study of German language, literature, or culture. May be repeated for credit. Students must obtain chair's approval and arrange for supervision by an appropriate member of the department. (Fall and spring)

197–98 **Senior Honors Thesis** (3–3) Staff
Senior honors thesis on a topic related to German language, literature, or culture. Required of and open only to honors candidates in the department. (Academic year)

SLAVIC LANGUAGES AND LITERATURES

1–2 **Basic Russian** (4–4) Shatalina and Staff
First part of beginning course in fundamentals of speaking, understanding, reading, and writing Russian. Prerequisite to Slav 2: Slav 1. Laboratory fee, $50 per semester. (Academic year)

3–4 **Basic Russian** (4–4) Shatalina and Staff
Second half of beginning course in fundamentals of speaking, understanding, reading, and writing Russian. Prerequisite to Slav 3: Slav 2 or equivalent. Prerequisite to Slav 4: Slav 3. Laboratory fee, $50 per semester. (Academic year)

5–6 **Intensive Basic Russian** (8–8) Robin and Staff
Beginning intensive course in fundamentals of speaking, understanding, reading, and writing Russian (equivalent to Slav 1–2 and 3–4). Recommended for majors. Prerequisite to Slav 6: Slav 2 or 5 or equivalent. Laboratory fee, $70 per semester. (Academic year)

9–10 **Intermediate Russian** (5–5) Shatalina and Staff
Practice in speaking, listening, reading, and writing at the intermediate level. Prerequisite: Slav 4 or 6 or permission of instructor. (Academic year)

13–14 **Russian for Heritage Speakers** (3–3) Guslistova
Prepares heritage speakers of Russian for advanced study in Russian at the third-year level and beyond, including content courses in literature and area studies. (Academic year)

21–22 **Basic Czech** (3–3) Staff
Beginning course in fundamentals of speaking, understanding, reading, and writing Czech. Prerequisite to Slav 22: Slav 21 or equivalent. Laboratory fee, $50 per semester. (Offered when the demand warrants)

23–24 **Basic Second-Year Czech** (3–3) Staff
Second half of beginning course in fundamentals of speaking, understanding, reading, and writing Czech. Prerequisite to Slav 23: Slav 22; prerequisite to Slav 24: Slav 23. (Offered when the demand warrants)

31–32 **Basic Polish** (3–3) Staff
Beginning course in fundamentals of speaking, understanding, reading, and writing Polish. Prerequisite to Slav 32: Slav 31. (Offered when the demand warrants)

33–34 **Intermediate Polish** (3–3) Staff
Practice in speaking, listening, reading, and writing at the intermediate level. Prerequisite: Slav 32. (Offered when the demand warrants)

41–42 **Ukrainian Language and Culture** (3–3) Staff
Introduction to Ukrainian language, culture, and history. (Offered when the demand warrants)

91–92 **Introduction to Russian Literature—in English** (3–3) Rollberg
Slav 91: Russian literature and society, 1800–1860s, concentrating on the Golden Age of Russian literature; poems and stories by Pushkin, Lermontov, Gogol, and Turgenev. Slav 92: Russian literature and society on their way to modernity; great works of prose and drama by Dostoevsky, Tolstoy, Chekhov, and Bunin. (Academic year)

101–2 **Readings in the Russian Press** (3–3) Guslistova
Reading and analysis of current Russian periodicals. For graduate students with a reading-language proficiency requirement.

109–10 **Russia Today: Topics in Advanced Russian** (3–3) Staff
Practice in speaking, listening, reading, and writing at the advanced level. Prerequisite: Slav 10 or 12 or permission of instructor. (Academic year)

161 **Russian Culture to 1825** (3) Staff
Survey of Russian cultural heritage from its ancient origins through the early 19th century. Architecture from the medieval period through the end of the Empire style. Iconography, the influence of the Church, and effects of the West on Russian culture.

162 **Russian Culture since 1825** (3) Staff
Survey of Russian culture from the 19th century through the present, including intellectual movements; realism in music, art, and theatre; ballet; avant-garde painting; and effects of Soviet policies and of Perestroika.

165 **20th-Century Russian Literature to World War II** (3) Staff
Russian literature and culture of the first half of the 20th century: the impact of the revolution on writers and literature; avant-garde, socialist realism, and emigre literature (Nabokov)—in English.

166 **Russian Literature from World War II to the Present** (3) Staff
Literature in wartime and in postwar years from Solzhenitsyn to the latest trends: the "thaws," village and urban prose, post-Soviet literature, Russian postmodernism—in English.

171 **19th-Century Russian Prose** (3) Rollberg
Reading and discussion of selected prose texts of the 19th century from Pushkin to Chekhov—in Russian. Prerequisite: Slav 10 or 12 or equivalent; Slav 91–92. (Fall, even years)

172 **19th-Century Russian Poetry** (3) Rollberg
Reading and discussion of selected poetry of the 19th century (Pushkin, Lermontov, Nekrasov, and others)—in Russian. (Spring, odd years)

173 **20th-Century Russian Prose** (3) Rollberg
Reading and discussion of selected prose of the 20th century from Bunin to Solzhenitsyn—in Russian. (Fall, odd years)

174 **20th-Century Russian Poetry** (3) Rollberg
Reading and discussion of selected poetry of the 20th century from Blok to Brodsky—in Russian. Prerequisite: Slav 10 or 12 or equivalent; Slav 165, 166. (Spring, even years)

185–86 **Introduction to Russian Cinema** (3–3) Rollberg
(In English; all films subtitled.) Slav 185: From Russian silents to the introduction of sound and color (1896–1946). The great revolutionary directors—Eisenstein, Pudovkin, Dovzhenko. Slav 186: From post-war to post-perestroika cinema (1946–1996): war films, adventure, films about youth.

195 **Special Topics** (3) Staff
Directed study of East European languages, literatures, or cultures. May be repeated for credit. Students must obtain chair's approval and arrange for supervision by an appropriate member of the department. Prerequisite for Russian: Slav 9–10 or 11–12, 91–92, 165, 166.

197–98 **Senior Honors Thesis** (3–3) Staff
Senior honors thesis on a topic related to Russian language, literature, or culture. Required of and open only to honors candidates in the department.

GREEK

See **Classical and Semitic Languages and Literatures.**

HEALTH SCIENCES

The following courses, offered by the Health Sciences Programs in the School of Medicine and Health Sciences, are available to undergraduates across the University and pertain to the secondary field in health sciences. Prerequisites may be established for the courses. For information on bachelor's degree programs in health sciences, please contact the Office of Admissions, Health Sciences Programs, School of Medicine and Health Sciences.

101 **Psychosocial Aspects of Health and Illness** (3)
Comprehensive introduction to the psychological and social aspects of health and wellness. Emphasis on the development of communication skills and the

establishment of caring relationships. Discussions of special situations such as working with dying patients and patients with self-destructive behaviors.

102 **Pathophysiology** (3)
Biomedical and scientific framework for the understanding of human disease mechanisms and biologic processes. Lecture presentations cover infectious, immunologic, cardiovascular, genetic, respiratory, gastrointestinal, neoplastic, reproductive, renal, hematologic, neurologic, and musculoskeletal diseases.

103 **Health Policy and the Health Care System** (3)
Incorporates economic theory and policy analysis methodology to analyze the impact of changes in the health care system on the practice of health sciences professionals and the quality and process of health care. Development of critical thinking skills through review of current medical literature.

104 **Management of Health Science Services** (3)
Application of management and organizational principles to the delivery of services provided by health sciences disciplines. Issues addressed include information systems, leadership, team building, fiscal management, human resources management, quality improvement, and management of conflict and change.

105 **Ethics for Health Professionals** (3)
Basic issues, approaches, and requirements of ethically acceptable decision making with patients, including patient confidentiality, conflicts of interest, allocation of scarce resources, occupational risks in health care, and professional responsibility for overall quality of care.

107 **Theory and Practice of Research in a Clinical Setting** (4)
Fundamentals of clinical research methods, design, and analysis related to emergency medicine.

HEBREW

See **Classical and Semitic Languages and Literatures.**

HISTORY

Professors R. Thornton, P.F. Klarén, R.E. Kennedy, Jr., W.H. Becker, L.P. Ribuffo, E. Berkowitz, R.H. Spector, J.O. Horton, L.L. Peck, M.E. Saperstein, R.J. Cottrol, D.K. Kennedy, A.M. Black (*Research*), M.A. Atkin (*Chair*), T. Anbinder
Associate Professors R.B. Stott, H.L. Agnew, E.A. McCord, C.E. Harrison, D.R. Khoury, J. Hershberg, D. Yang, A.L. Alexander, S. McHale, H.M. Harrison, E.H. Cline
Assistant Professors N.G. Seavey (*Research*), A. Zimmerman, K.W. Larsen, M. Norton, N. Blyden, G.A. Brazinsky, H. Abugideiri, A. Lester, D. Silverman
Adjunct Associate Professor K. Bowling
Director and Principal Investigator of the First Federal Congress Project C. Bickford

Bachelor of Arts with a major in history—The following requirements must be fulfilled:

1. Majors must meet the general requirements of Columbian College of Arts and Sciences, selecting specific courses in consultation with either a departmental or college advisor.

2. Majors must either take or waive three of the following five introductory courses: Hist 38, 39–40, and 71–72. Waiver may be accomplished by passing a departmental examination, which is held near the beginning of classes. Credit as well as waiver may be obtained by departmental examination or by scoring 4 or 5 on the Advanced Placement Examination, and waiver may be obtained by scoring 650 or above on the College Board Achievement Test. Neither waiver nor credit is awarded by CLEP subject examination.

3. Majors must complete Hist 198 and 199, plus seven courses chosen from groups (a), (b), and (c), below, with the following distribution: at least three courses from one of the groups, at least two courses from a second group, at least one course from the third group, with the seventh course chosen from any of the three groups.

(a) Europe—Hist 102, 103, 104, 109, 110, 111, 112, 113, 115, 117, 121, 122, 123, 124, 125, 131, 132, 135, 136, 141, 142, 143, 144, 147, 148, 149, 150, 151, 152, 153, 154, 157, 158, 159, 161

(b) United States—Hist 103, 104, 126, 127, 129, 133, 134, 137, 138, 139, 140, 160, 161, 166, 167, 168, 169, 171, 172, 173, 174, 175, 176, 177, 178, 179, 182, 183, 184, 185, 186, 197

(c) Russia, Asia, Africa, and Latin America—Hist 107, 108, 114, 115, 116, 117, 118, 126, 127, 145, 146, 158, 161, 162, 163, 164, 165, 183, 187, 188, 189, 190, 193, 194, 196

Special topics courses numbered 101 and courses in the 700 Series may also satisfy one of the three field requirements. Majors should check with the major advisor on the applicability of such courses.

For Special Honors in history, a history major must (1) meet the general honors requirements listed under University Regulations; (2) apply for honors candidacy and complete Hist 199 before the end of the junior year; and (3) in the ensuing semester, enlarge upon the research project undertaken in Hist 199 while enrolled in Hist 191. Only if the thesis completed in Hist 191 merits the grade of *A* or *A*− will Special Honors be recommended.

Minor in history—Undergraduate students who select a minor in history must ordinarily declare their intention to the departmental advisor no later than the beginning of their senior year. Such students may choose a nonspecialized history curriculum, or may concentrate in one area, such as ancient history, medieval history, early modern Europe, modern Europe, the Middle East, Russia and East Europe, the United States, Latin America, or the Far East, or in one field, such as economic, social, intellectual, diplomatic, political, black, or women's history. In each case the program of courses will be planned in consultation with the history advisor. To meet the departmental requirements for a minor, the student must complete one course chosen from Hist 38, 39, 40, 71, or 72 and at least five additional approved 100-level history courses.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Waiver Examinations: Waiver examinations are given twice each year, near the beginning of classes in the fall and spring semesters.

Course Accessibility: All 100-level courses are open to students without history course prerequisites with the exception of Hist 136, 157, 160, 191, 192, 198, and 199.

38 **World History, 1500–Present** (3) D. Kennedy and Staff
An introduction to world history over the past half millennium, stressing themes of exchange and integration, tracing the ways various peoples of the world became bound together in a common system. (Fall)

39–40 **European Civilization in Its World Context** (3–3) Staff
Introduction to the history of Europe and the West, emphasizing primary sources and their interpretation. Hist 39: from the beginning of written culture through 1715. Hist 40: From 1715 to the present. (Academic year)

42 **Women in Western Civilization** (3) Staff
Same as WStu 1.

50 **Washington, D.C.: History, Culture, and Politics** (3) Staff
Same as AmSt 50.

71–72 **Introduction to American History** (3–3) Staff
Hist 71: political, social, economic, and cultural forces of the United States, from the earliest settlements to 1876. Hist 72: from 1876 to present. (Academic year)

101 **Special Topics** (3) Staff
Historical perspectives on great issues of past and present. Topics announced in the *Schedule of Classes*.

102–3 **History of Science** (3–3) Staff
Survey of Western science, technology, and medicine. Hist 102: From ancient Egypt and Mesopotamia to the Renaissance Scientific Revolution. Hist 103: From the 18th century to the present.

104 **Topics in the History of Recent Science** (3) Staff
Aspects of 20th-century science and its immediate antecedents. May be repeated for credit.

107 **The Ancient Near East and Egypt to 322 B.C.** (3) Cline
Survey of Egyptian, Mesopotamian, Anatolian, West Semitic, and Iranian civilizations from the Neolithic period to Alexander's conquest. Same as Clas 117.

108 **History of Ancient Israel** (3) Cline
The history of ancient Israel from the Patriarchs through the Romans. Topics include historical, archeological, political, social, cultural, religious, diplomatic, military, economic, and intellectual events, movements, and relationships. Same as Clas 118. (Spring, alternate years)

109 **Early Aegean and Greek Civilizations to 338 B.C.** (3) Staff
Neolithic background; Bronze Age—Minoan, Helladic, and Mycenaean civilizations; classical Greek civilization to the Macedonian conquest. Same as Clas 119. (Fall)

110 **The Roman World to 337 A.D.** (3) Staff
Prehistoric Italy; rise and decline of the Roman Empire and Latin civilization; cultural, social, and political developments in the Greek world under Roman rule. Same as Clas 120. (Spring)

111 **The Early Middle Ages** (3) Lester
The evolution of Roman, Islamic, Byzantine, and Germanic societies from the end of the Roman Empire through the rise of Latin Christendom by the year 1000; the nature of political power, role of religion, place of gender, cultural production, and changing social structures. (Fall)

112 **The High Middle Ages** (3) Lester
The evolution of Europe, ca. 1000 to 1400, with emphasis on the organization of the medieval state; the role of law and religion, considering the impact of the crusades and religious dissent; economic growth; the rise of urbanism; aspects of daily life, artistic innovation, and new modes of thought. (Spring)

113 **History of the Jews in Christian Europe to the 18th Century** (3) Saperstein
The position of Jews in relation to Church and State; organization and self-government of the Jewish community; movements of Jewish spirituality; divisions within Jewish society; the background of Emancipation and Enlightenment. (Fall)

114 **History of the Jews in Islamic Lands** (3) Saperstein
The legal status of Jews under Islam; the impact of the Muslim conquest and Abbasid rule over the Jewish community of Babylon, the flourishing of Jewish civilization in Muslim Spain; Metatherian Jewish society in the Middle Ages; the Ottoman Empire; modernity and its effects. (Fall, alternate years)

115 **Messianic Movements and Ideas in Jewish History** (3) Saperstein
A survey of Messianism as a central force in Jewish history, stressing both theoretical implications and concrete manifestations. Topics include Biblical Christianity, the origins of Christianity as a Jewish Messianic movement, the Sabbatian movement, Zionism, and contemporary messianism. (Fall, alternate years)

116 **History of Africa** (3) Abugideiri, Blyden
Survey of political, cultural, and economic development from ancient times to the present, with emphasis on the rise and demise of European colonialism.

117 **The British Empire** (3) D. Kennedy
The British Empire from its rise in the 17th century to its demise in the 20th century. (Alternate years)

118 **China to 1800** (3) McCord
Survey of Chinese civilization from its ancient beginnings to the last imperial dynasty. (Fall)

121 **The Age of the Renaissance** (3) Staff
Emergence of new forms of expression, and politics and society in Europe from the 14th century to about 1550. Emphasis on Italy and the Byzantine background. (Spring)

122 **The Reformation in Western Europe** (3) Staff
Religious, political, and social consequences of the theological upheavals of the 16th century. (Spring)

123–24 **European Intellectual History** (3–3) E. Kennedy
Hist 123: The "Century of Genius" and the Enlightenment; God, nature, man, and society, from Descartes to the French Revolution. Hist 124: Responses to the French Revolution and the Enlightenment; historicism, evolution; nihilism, psychoanalysis; communism; fascism; existentialism, structuralism, postmodernism, and neo-orthodoxy. (Alternate academic years)

125 **Women in European History** (3) Staff
A study of the role of women in the political, social, intellectual, and economic life of Europe from the Middle Ages to the 20th century. (Spring)

126 **The United States and the Wars in Indochina, 1945–1975** (3) Spector
The American role in the Indochina Wars, emphasizing the period 1961–1975, and from the perspectives of the Vietnamese, French, and Americans in Viet-

nam. Related intellectual and political developments in the United States; Cold War relationships with China and the Soviet Union. (Fall)

129 **War and the Military in American Society from the Revolution to the Gulf War** (3) Spector
Social and psychological dimensions of war and military service. (Spring)

130 **Sexuality in U.S. History** (3) Staff
Same as AmSt/WStu 130.

131–32 **History of Germany** (3–3) Zimmerman
Political, social, and cultural development. Hist 131: From mid-17th century to Bismarck. Hist 132: From William II to the present. (Academic year)

133 **Recent U.S. History, 1890–1945** (3) Ribuffo, Berkowitz
Political, social, diplomatic, and intellectual developments, with particular emphasis on the "searching" '20s and New Deal. (Fall)

134 **Contemporary U.S. History Since 1945** (3) Ribuffo
Political, social, diplomatic, and intellectual developments, with particular emphasis on the Cold War, "silent" '50s, and disrupted '60s. (Spring)

135 **The Two Germanys and the Cold War** (3) H. Harrison
Why was Germany divided after World War II? Why did it stay divided for 45 years? How was it reunited in 1990? This course examines developments in East and West Germany, relations between the two Germanys during the Cold War, their foreign policies, and how other countries treated them.

136 **Europe in the 20th Century** (3) Staff
Diplomatic, political, and cultural developments from the turn of the century to the present. Credit may not be earned for both Hist 136 and 157. Prerequisite: Hist 40. (Spring)

137–38 **History of American Foreign Policy Since World War II** (3–3) Thornton
Emphasis on American and Soviet strategy and foreign policy in the era of the Cold War. Hist 137: World War II to the Vietnam War; Hist 138: Vietnam to the "New World Order." (Academic year)

139–40 **Women in the United States** (3–3) Murphy, C. Harrison
Survey of women's experience in U.S. history, the way gender has organized relations of power, and the impact of race, region, class, and ethnicity on women and on gender roles. Same as AmSt/WStu 139–40. (Academic year)

141–42 **History of France** (3–3) E. Kennedy
Hist 141: Old Regime: monarchy and social classes; the Church; the Enlightenment; the 1789 revolution; Napoleon. Hist 142: From 1814: breaks and continuities in the succession of regimes; the interplay between revolution and tradition; the weakened international position of France; Gaullism and the survival of France; European Unity. (Alternate academic years)

143 **The Making of the Modern Balkans** (3) Agnew
States of the Balkan peninsula—Slovenia, Croatia, Serbia and Montenegro, Bosnia, Albania, Macedonia, Greece, Bulgaria, and Romania—including developments since the decline of the Ottoman Empire and the emergence of Balkan nationalist movements, and continuing through the collapse of the Soviet bloc. (Fall, alternate years)

144 **The Habsburgs in East Central Europe** (3) Agnew
History of the Habsburg monarchy in its East Central European Context. Reformation and Counter-Reformation; conflict with the Ottoman Empire; great-power competition in Europe; response to the Enlightenment and the French Revolution; the rise of nationalism; and final dissolution in World War I. (Fall)

145 **Russia to 1801** (3) Atkin
Survey of Russian history from the rise of the Kievan confederation in the ninth century to the establishment of Imperial Russia as a European great power. Attention will be given to the political, socioeconomic, and cultural history of the East Slavs, especially the Russians. (Fall)

146 **Russia Since 1801** (3) Atkin
Survey of Russian and Soviet history from the reign of Alexander I to the Stalin era. Attention will be given to the contending forces of revolution, reform, and conservatism; diplomatic relations; economic development; and social change. (Spring)

147 **Victorian Britain** (3) D. Kennedy
Examines major themes in nineteenth-century British history: industrialism, democratization, urbanization, imperial expansion, class and gender schisms. (Fall, alternate years)

148 **The French Revolution** (3) E. Kennedy
Social, political, economic, and cultural history of the decade of revolution, 1789–1799. Attention to its structural consequences in France and in Europe at large. (Fall)

149 **Spain and Its Empire, 1492–1700** (3) Norton
Major transformations of the period: from cultural pluralism to ethnic homogeneity, from medieval fragmentation to imperial expansion in Europe and America; from religious reform to Catholic Reformation, from global dominance to decline. (Fall)

150 **Twentieth-Century Britain** (3) D. Kennedy
Examines major themes of twentieth-century British history: industrial decline, imperialism and decolonization, the making of a welfare state, the cataclysm of global war, integration with Europe. (Spring, alternate years)

151–52 **History of England** (3–3) Peck
Development of English civilization and its impact on Western culture. Hist 151: To 1689. Hist 152: Since 1689. (Academic year)

153 **Tudor England** (3) Peck
Aspects of the constitutional, social, intellectual, economic, and religious development of England, 1485–1603. (Fall)

154 **Stuart England** (3) Peck
The civil wars, Restoration, and Glorious Revolution. Political, religious, socioeconomic, and intellectual developments in England, 1603–1714. (Spring)

157 **20th-Century European Diplomatic History** (3) Staff
The main currents, with necessary 19th-century background, and related attention to the Middle East. Credit may not be earned for both Hist 136 and 157. Prerequisite: Hist 40. (Fall)

158 **Modern Jewish History** (3) Staff
A secular history of the Jewish people from the 18th century to the present state of Israel; emphasis on European and Middle Eastern political, economic, and cultural influences. (Spring)

159 **The Holocaust** (3) Saperstein
The origins, causes, and significance of the Nazi attempt to destroy European Jewry, within the context of European and Jewish history. Related themes include the behavior of perpetrators, victims, and bystanders; literary responses; contemporary implications of the Holocaust for religion and politics. (Spring)

160 **History of the Jewish People in America** (3) Staff
The study of the Jewish minority in America from colonial times to the present. Emphasis on the interaction between a powerful majority culture and that of protean minority people. Prerequisite: Hist 39–40 or 71–72. (Spring, alternate years)

161 **Jewish Historical Writing** (3) Saperstein
A survey of Jewish attitudes toward history and examples of Jewish historiography beginning with the Hebrew Bible. Emphasis will be on medieval and Renaissance historians and on the flourishing of historical writing in the past 150 years in Europe, Israel, and the United States. (Fall, alternate years)

162 **20th-Century Latin America** (3) Klarén
A survey of the main societal trends shaping Latin America in this century, with particular emphasis on such themes as populism, urbanization, reformism, modernization, nationalism, revolution, the military dictatorship, and the development process. (Spring)

163–64 **History of Latin America** (3–3) Klarén
Hist 163: Analysis of Spanish and Portuguese imperialism in the New World, 1492–1820. Hist 164: A problems approach to Latin America, 1820 to the present; thematic emphasis on neocolonialism, corporatism, liberalism, *caudillismo*, modernization, populism, and revolution. (Academic year)

165 **Revolution in 20th-Century Latin America** (3) Klarén
Examination of the major social revolutions in modern Latin America, especially in Mexico, Bolivia, Cuba, and Nicaragua; their origins, ideology, process, and outcomes. (Fall)

166 **Immigration, Ethnicity, and the American Experience** (3) Anbinder
Examination of the role of immigration, ethnicity, and ethnic conflict in American life, past and present, with particular attention to the urban immigrant

experience, and the prevalence of anti-immigrant sentiment throughout U.S. history. (Spring, alternate years)

167 **Themes in U.S. Cultural History** (3) Staff
Same as AmSt 167.

168 **America Before 1764** (3) Silverman
An examination of prehistory, colonization, and the shifting dynamics among European Americans, African Americans, and Native Americans before 1764. (Spring, alternate years)

169 **Revolutionary America** (3) Silverman
An examination of the War of Independence and other events that reshaped life for Native Americans, African Americans, and European Americans in the era of the American Revolution; emphasis on a continental approach to the period. (Spring, alternate years)

171–72 **U.S. Social History** (3–3) Horton, Stott
Hist 171: Daily life, institutions, intellectual and artistic achievements of the agrarian era, 1607–1861. Hist 172: The urban–industrial era from 1861 to present. Same as AmSt 171–72. (Academic year)

173 **African American History** (3) Horton, Alexander
Survey of the African American experience, emphasizing the contributions of black Americans to and their impact upon American history. Same as AmSt 173. (Fall)

175 **U.S. Constitutional History** (3) C. Harrison
Examination of the text and interpretation of the document that is the foundation of the American government, with special attention to the changing character of race and gender as constitutional classes. (Fall, alternate years)

176 **The Modern American Presidency** (3) Berkowitz
The development of the modern American presidency, from Theodore Roosevelt to Bill Clinton, examining the intersection of personal and impersonal forces in the creation of modern America.

177 **The Jacksonian Era and the Rise of Mass Politics** (3) Anbinder
The period 1828–1860 and its continuing significance to American society; emphasis on racial and gender divisions and changes in the legal and political systems. (Fall, alternate years)

178 **History of the American West** (3) Stott
The interaction of environment and cultures among the different peoples vying for occupancy of the trans-Mississippi region of the United States from the early 19th century to the present. (Fall, alternate years)

179 **U.S. Economic History** (3) Berkowitz
Survey of American economic history from colonial times to the present. Particular attention is given to the economics of slavery, the development of a national industrial economy, and the growth of the federal government as an influence on economic policy.

181 **U.S. Media and Cultural History** (3) Staff
Same as AmSt 181.

182 **U.S. Diplomatic History** (3) Hershberg
American foreign relations in the 20th century.

183 **International History of the Cold War** (3) H. Harrison, Hershberg
Key events and themes of the Cold War, drawing on new evidence from U.S., Soviet, Chinese, German, East European, Vietnamese, Cuban, and other sources. Related historiographical controversies from multiple national perspectives. Why the Cold War began, why it lasted for 45 years, and why it ended.

184 **Civil War and Reconstruction** (3) Anbinder
How tensions between the sections developed into violence, how a total war was fought on American soil, and how the experience of war affected the generation that lived through it. (Spring, alternate years)

185 **Black Women in U.S. History** (3) Alexander
Black Women from the Middle Passage to contemporary times. Same as AmSt/WStu 185. (Fall)

186 **U.S. Urban History** (3) Heap
The American city from colonial foundations to the present, relating social and economic forces to physical form. Special emphasis on transitions from pre-industrial to industrial to metropolitan forms, focusing on implications for public policy and historic preservation. Same as AmSt 186. (Fall)

187 **History of Modern China** (3) McCord
China since 1840, with particular attention to political developments. (Fall)

188 **History of Chinese Communism** (3) Thornton
Survey of the leadership, ideology, structure, and foreign and domestic policies of the Chinese Communist Party from its inception to the present. (Fall)

189 **History of Modern Japan** (3) Yang
Japan's century of modernization—from the Meiji Restoration of 1868 to the present. Emphasis on historical, political, economic, and cultural factors. (Fall)

190 **History of Korea** (3) Larsen
An introduction to the history and culture of Korea from antiquity to the present. (Fall)

191 **Senior Honors Thesis** (3) Staff
Required of and open only to undergraduate honors candidates in history.

192 **Internship** (3) Staff
Study of history through internships in museums, libraries, Congress, or other appropriate institutions and agencies. Prerequisite: approval of department. (Fall and spring)

193 **History of the Middle East** (3) Khoury
Byzantine, Arab, Persian, and Islamic backgrounds; rise and decline of the Ottoman Empire; action of European powers in the area; Ottoman breakup into the Turkish Republic and other states. (Fall)

194 **History of the Modern Middle East** (3) Khoury
Beginning with Napoleon's invasion of Egypt. Development of nationalism and of modern states; impact of the West on culture and institutions; great-power imperialism; crises of Turkish Straits, Suez, Arab–Israeli relations; and other issues. (Spring)

196 **The Modern Transformation of East Asia** (3) McCord, Yang
The social, institutional, and intellectual transformation of China, Japan, and Korea from the mid-19th century to the present. (Spring)

198 **Readings for the History Major** (3) Staff
Required of history majors; this course should be taken during the junior or senior year. Readings and discussions on major trends in history; representative selections from the classics of historical literature. Students who receive credit for Hist 198 cannot receive credit for Hist 201. (Fall and spring)

199 **Thesis** (3) Staff
Required of history majors. Usually taken in the junior year. A research paper is prepared using primary sources. Students who earn a grade of *A* or *A–* may be eligible to take Hist 191; check with the department. (Fall and spring)

HONORS

Interim Director G. Baxter
Assistant Professors H. Abugideiri, W. Winstead, T. Michael

University Honors Advisory Committee
H. Agnew, S. Badie, I. Creppell, M. Granger, R. Heller, L. Jacobson, P. Klarén, L. Moersen, M. Pardavi-Horvath, G. Wald, J. Ziolkowski

The University Honors Program offers a program of enhanced study to undergraduates at The George Washington University. Incoming students may apply to the program when they apply for admission to the University. Current GW students may apply to the Honors Program after completing one semester at GW.

Scholastic Requirements—All Honors Program students must take a number of Honors courses each semester and must maintain a cumulative GPA of 3.4 or higher. For each semester that an Honors student meets this requirement, his or her transcript will be marked "University Honors Program Scholar." Students who fail to maintain a cumulative GPA greater than 3.4 or fail to take an Honors course in a given semester are considered probationary members and have their transcript marked "Member, University Honors Program." Students whose cumulative GPA falls to the level from which it is impossible to graduate with a cumulative GPA of 3.4 or higher are removed from the Program. Freshman students who fail to achieve a cumulative GPA of 3.0 are removed from the Program.

General Requirements—Freshman students must take the Honors first-year proseminar (Honr 15–16) and may take in addition any Honors course numbered below 100. Each stu-

dent in the Honors Program must complete a senior thesis or research project. This project may be an Honors senior thesis; the course, seminar, or paper for departmental special honors; or one of the senior seminars offered by the Honors Program. Under appropriate conditions, the senior project may be done during the student's junior year.

Students may get Honors credit for internships or regular University courses through course conversion by making arrangements through the Honors Program offices. CCAS and ESIA students who wish to do this must have completed 60 credit hours of course work; School of Business and SEAS students must have completed 30 hours.

Honors Courses—The Honors Program offers a wide range of courses that varies from semester to semester, depending upon the availability of faculty and department resources. The Honors Program offices provide a current list of courses offered. Honors courses numbered 100 and below are open to all Honors Program students and fulfill curriculum requirements in at least one of the schools. Courses numbered 105 to 179 are open to all sophomore, junior, and senior Honors Program students and other qualified students on a space-available basis. (Qualified students are those who meet the grade-point requirements that students in the Honors Program must maintain at that level.) Courses numbered in the 180s are open to all junior and senior Honors Program students, and courses in the 190s are senior seminars.

When an Honors course covers the content of a departmental course, credit is not allowed for both. Please check with the Honors Program offices for a list of course equivalents. In most instances applicable Honors courses may be substituted for program requirements; students should consult with their advisors to determine applicability.

A full description of the University Honors Program is provided in the Honors Program Handbook, available at the Honors Program offices or at www.gwu.edu/~uhpwww/. The website also gives a list of current classes and activities of the Honors Program.

15–16 **Honors Proseminar** (3–3) Staff
Required for first-year students in the Honors Program. The classical texts and major ideas of various civilizations that form the fundamental bases of modern thought. Honr 15: Ancient origins of modern thought. Honr 16: Development of modern thought through recent times. (Academic year)

25 **Honors Introduction to Logic** (3) Staff
Methods of deductive and inductive logic with emphasis on sentential calculus. Argument analysis, recognition of fallacies, legal reasoning, and practical application of knowledge. (Fall and spring)

28 **Honors Statistics** (3) Nayak and Staff
Statistical reasoning as it relates to public policy, particularly medical, economic, and social policy. Emphasis on the philosophical basis of statistics. (Fall and spring)

33–34 **Honors General Chemistry** (4–4) Zysmilich
An accelerated introductory chemistry course that includes special and advanced topics. Emphasis on laboratory research. Prerequisite: one year each of high school algebra with trigonometry and chemistry with laboratory. Laboratory fee, $55 per semester. (Academic year)

41 **Honors Introduction to Sociology** (3) Staff
An introduction to the field through the writings of the pioneer researchers, including Emile Durkeim, Max Weber, George Herbert Mead, and Karl Marx. (Fall and spring)

42 **Honors Sociocultural Anthropology** (3) Staff
An accelerated introduction to the study of cultures that emphasizes field research. (Fall and spring)

43 **Honors Microeconomics** (3) Staff
An introductory microeconomics course that considers both the philosophical basis of economics as well as its methods and applications. (Fall)

44 **Honors Macroeconomics** (3) Bradley and Staff
An accelerated introductory macroeconomics course that includes the study of special topics. (Spring)

45 **Honors Introduction to Comparative Politics** (3) Staff
Methods of finding similarities and differences across political systems related to the state, political culture, and other aspects. (Fall)

53 **Honors Topics in Music** (3) Staff
Special topics of musicology studied with respect to its cultural and historical context. (Fall)

59 **Honors Introduction to Acting** (3) Wade and Staff
Practical acting skills and the theory underlying method acting. Emphasis on the writings of Stanislavsky and his followers. (Fall and spring)

63–64 **Honors English Literature** (3–3) Staff
A survey of English literature emphasizing modern theory-based criticism. Honr 63: From the Middle Ages to the Enlightenment; Honr 64: From the Enlightenment to the Modernist period. (Academic year)

92 **Business Law: A Comparative International Approach** (3) Moersen
A comparative analysis of business law in the United States and other common law countries, as well as countries following other legal traditions. Emphasis on international transactions. (Spring)

110 **Honors University Symposium** (0 or 1) Baxter
An intensive three-day course that brings together prominent speakers in a selected field and University faculty and students for lectures and discussion. (Fall and spring)

125 **Justice and the Legal System** (3) Kasle
An examination of justice from a legal and philosophical point of view. The course will be taught as a law class using the Socratic method. (Fall)

136 **Issues and Innovation in American Education** (3) Paley
An introductory course that explores various spheres in American educational thought and practice. Historical, psychological, sociological, and pedagogical standpoints are considered. (Spring)

170 **Special Topics in Literature and Theatre** (3) Staff
This course examines dramatic texts across historical periods and regional or national boundaries.

175 **Honors Special Topics** (1 to 4) Staff
Topics are announced in the *Schedule of Classes* and the Honors Preregistration newsletter. (Fall and spring)

180 **Honors Course Conversion** (0)
Requires students to complete additional in-depth course work in a non-Honors course.

182 **Honors Internship** (1 to 3) Baxter
Off-campus internship, usually in the student's major field. Includes regular assignments to put the work in a broader context. (Fall and spring)

184 **Honors Independent Study** (0 to 3) Staff
Independent study conducted in close cooperation with a faculty member.

185 **Honors Research Assistantship** (0 to 3)

196 **Honors ESIA Senior Seminar** (3) East
This course compares the ways nations conduct their foreign policies on various issues. Fulfills Honors senior thesis requirement. (Spring)

198 **Honors Thesis** (3) Staff
A one- or two-semester thesis under faculty guidance. May be repeated for credit. (Fall and spring)

199 **Senior Seminar** (3) Staff
Interdisciplinary approach to the Honors senior thesis requirement. Includes a weekly seminar to guide students through the senior thesis process. (Fall and spring)

HUMANITIES

1 **Roots of the Western Tradition** (3) Cook
Basic ideas of Western thought from early Greek, Roman, Judaic, and Christian traditions. Representative readings in drama, epic, historical writings, oratory, creation stories, scriptural traditions, philosophy, and spiritual autobiography.

2 **Ideas in Western Culture: Aquinas to Locke** (3) Staff
An examination in historical context of central texts from the Middle Ages, the Renaissance, and the Enlightenment: Aquinas, Dante, Machiavelli, Erasmus, Luther, Montaigne, Bacon, Shakespeare, Rabelais, Descartes, Milton, and Locke.

3 **The Enlightenment** (3) Ganz
Primary works representative of 18th-century European and American culture, examined from thematic and historical perspectives. Music, drama, poetry, the novel, art, architecture, economics, philosophy, and science are among the subjects included; 18th-century notions of Nature, reason, liberty, equality, natural law, and the question of human perfectibility.

4 **Romanticism and Revolution: The 19th Century** (3) Plotz
Major themes of 19th-century culture from 1789 to 1900 in representative works of European and American art, literature, music, drama, philosophy, and theology. The 19th-century resources of Washington—museums, monuments, collections, concerts, plays—form part of the curriculum.

5 **The 20th-Century Consciousness** (3) Staff
Major themes and paradigms of 20th-century civilization as expressed in key literary and philosophic texts, visual arts, music, and cultural artifacts. Key issues include the meaning of history in the age of two world wars; the Holocaust and the crisis of reason; the authority of science; the decline of Western hegemony; modernism and postmodernism.

6 **Asian Humanities** (3) Chaves, Kim-Renaud
The traditional art and literature of the cultures of South Asia (India, Pakistan, Sri Lanka, Tibet) and East Asia (China, Korea, Japan). Attention to religious and philosophical systems as well as to continuities and changes in modern Asian culture.

7 **African Humanities** (3) Blyden
An introduction to the literature, art, and philosophy of the African continent in historical, cultural, and geographic contexts. Overview of sculpture, rock painting, and architecture; the oral tradition and modern literature; traditional philosophies and religions. The roles of Islam and Christianity in Africa.

8 **Islamic Humanities** (3) Khoury
Facets of Islamic civilization, including the defining features of the Islamic tradition and the history within which it has unfolded. The diversity within the Islamic community is considered, especially in its encounter with modernity.

INTERNATIONAL AFFAIRS

University Professor J.N. Rosenau
Professors G.M. Adams (*Practice*), C.J. Allen, H.G. Askari, M.A. Atkin, W.H. Becker, E. Berkowitz, R. Bhala, A. Black (*Research*), B.L. Boulier, M.D. Bradley, N.J. Brown, J. Chaves, J.J. Cordes, W.K. Cummings, H.J. Davis, C.J. Deering, R.M. Dunn, Jr., M.A. East, H.B. Feigenbaum, J. Ferrer (*Research*), M. Finnemore, L. Fuerth (*Research*), J. Goldgeier, D. Gow (*Practice*), R. Grinker, H. Harding, P. Hotez, K.F. Inderfurth (*Practice*), G. Kaminsky, D.K. Kennedy, R.E. Kennedy, Jr., Y.K. Kim-Renaud, P.F Klarén, J. Kuipers, J.M. Logsdon, G. Ludlow, M. Marquardt, C. McClintock, B.D. Miller, M.O. Moore, H.R. Nau, J. Pelzman, J.M. Post (*Practice*), B. Reich, W. Reich, L.P. Ribuffo, R.W. Rycroft, D. Shambaugh, S.C. Smith, M. Sodaro, R.H. Spector, R. Steinhardt, J.-F. Thibault, R. Thornton, N.S. Vonortas, R. Weiner, R. Williamson (*Research*), S. Wolchik, H.L. Wolman, A.M. Yezer
Associate Professors H.L. Agnew, D. Avant, S. Balla, A. Bowie, J. Brinkerhoff, Y. Captain, E. Chako, R.W. Click, B.J. Dickson, M. Gonglewski, D.A. Grier, S. Hamano, H.M. Harrison, J. Hershberg, D. Khoury, K.W. Larsen, J.H. Lebovic, D.L. Lee, S. Livingston, M. McAlister, E.A. McCord, S. McHale, M.M. Mochizuki, M. Price, J.A. Quiroga, S. Rehman, R. Robin, F. Robles, P. Rollberg, S. Sell, M.B. Stein, S. Suranovic, H.J. Teegen, G.C.Y. Wang, R. Weiner, L. Willnat, D. Yang, J. Yang
Assistant Professors H. Abugideiri, N. Blyden, G. Brazinsky, M. Cipriani, M. Haider, I.L. Hanami, K. Lord, S. Lubkemann, K. Morgan, E.A. Posner, A. Prakash, C. Rector, L.A. Riddle, J. Ryfa, R.L. Skolnik (*Research*), J.M. Smith, E. Voeten, J.H. Williams, L. Willnat, A. Zimmerman
Adjunct Professors R. Butterworth, S. Commins, J. Hardt, S. Johnson, J. Kilpatrick, L. Kjonnerod (*Practice*), M. Kuchinsky, J. Mendelsohn, B. Powers (*Practice*), R.M. Samaniego, D. Shinn, R. Sutter, W. Wise
Adjunct Associate Professor K. Thachuk
Adjunct Assistant Professor K. Healy

The Elliott School of International Affairs offers a multidisciplinary program leading to the degree of Bachelor of Arts in the field of international affairs. The program provides students with a broad background in the general areas of international affairs as well as a solid liberal arts education focusing on an understanding of major historical and contemporary issues in international affairs.

Bachelor of Arts with a major in international affairs—The following requirements must be fulfilled.

1. The general curriculum requirements stated under the Elliott School of International Affairs.

2. Required courses for the major—Econ 181–82; one course selected from Hist 137, 138, 182; one course selected from approved sections of Hist 101, 135, 136, 157, 183; one course selected from PSc 139, 140, 142, 144, 146, 149; one course chosen from an approved list of Anth/Geog/PubH courses; and third-year language proficiency. Students must take a research methods course to be chosen from among Anth 117; Geog 105; PSc 101; Psyc 101; Soc 101, 111, 112; Stat 51, 53, 105, 111, 127, 129.

3. Concentration—The Elliott School offers a large number of functional and regional concentrations toward the major in international affairs. Each student chooses 15 credit hours of additional course work in one of the following concentrations. Functional: international politics; international economics; comparative political, economic, and social systems; international development; contemporary cultures and societies; conflict and security; global public health; international environmental resources. Regional: Africa, Asia, Europe and Eurasia, Latin America, Middle East. The Elliott School maintains lists of courses that may be applied toward each of these concentrations. In addition to the courses that appear on these lists, Topics courses and 700 Series courses may be included as part of the required 15 credit hours if approved by the advisor.

Special Honors—In addition to the general requirements stated under University Regulations, a candidate for Special Honors in international affairs must have attained a 3.4 grade-point average overall and complete either an Elliott School or Honors senior seminar, or an Honors senior thesis or a major independent study research project approved by the program director. Students must apply for honors candidacy prior to the beginning of the senior year.

The following courses carry the International Affairs (IAff) designation. All other courses listed above will be found under the appropriate department designation.

5 **Introduction to International Affairs: A Washington Perspective** (4) Staff
A required course for Elliott School freshmen. An introduction to the study of international affairs, while integrating material designed to orient students to the Elliott School, the University, and the city of Washington, and the study of international affairs. Open only to first-year students in the Elliott School. (Fall and spring)

90 **Latin America: Problems and Promise** (3) Klarén, Price
An interdisciplinary course in Latin American studies designed to introduce undergraduates to the diverse, rich, and complex history, politics, economy, culture, and society of Latin America. (Fall)

91 **East Asia—Past and Present** (3) Larsen, McCord, McHale, Yang
An interdisciplinary course offering a comprehensive and integrated introduction to the civilization and present problems of East Asia. (Spring)

92 **Russia and Eastern Europe: An Introduction** (3) Staff
A multidisciplinary introduction to the lands and cultures of the former Soviet Union and Central and Eastern Europe. The main emphasis is on history and politics, with attention also given to economics, trade, geography, military matters, literature, and the media. (Fall)

93 **Africa: Problems and Prospects** (3) Staff
Aspects of the environment, culture, and politics as they affect the present and anticipated future of Africa. (Spring)

94 **Europe: International and Domestic Interactions** (3) Sodaro
A multidisciplinary view of contemporary Europe, including the E.U. states, other states of Eastern Europe, and Turkey. The widening processes of political, judicial, economic, cultural, and security integration. Prerequisite: IAff 5, PSc 1, Hist 136 or 157. (Spring)

190 **Special Topics** (3) Staff
International affairs issues of a current or topical nature. Topics announced in the *Schedule of Classes*. May be repeated for credit.

191 **Senior Seminar** (3) Staff
Intensive readings, discussion, research, and writing. Departmental approval required.

195 **Internship** (0 to 3) Staff
Internships in public, private, and nonprofit organizations concerned with international affairs. Admission by permission of instructor and Elliott School Office of Student Services.

198 **Independent Study and Research** (1 to 3) Staff
For upper-division students only. Written permission of instructor required. May be repeated for credit with permission of the dean.

INTERNATIONAL BUSINESS

Professors Y.S. Park, H.G. Askari, F. Robles, R. Weiner (*Chair*)
Associate Professors S.S. Rehman, J. Yang, H.J. Teegen, R.W. Click, J. Ferrer (*Research*), J.W. Spencer
Assistant Professors P. Dastidar, L.A. Riddle, M. Ayyagari, R. Kosova
Instructor A. Kirca

See the School of Business for programs of study leading to the degree of Bachelor of Business Administration.

160 **Introduction to International Business** (3) Spencer, Dastidar, Riddle Ayyagari, Kosova, Kirca
The international business environment, including social, cultural, political, technological, and institutional domains. Multinational corporation strategic imperatives and organizational challenges, including financial, marketing, human resources, and other aspects of management. Prerequisite: Econ 11–12; prerequisite or corequisite: BAdm 145 or Econ 181 or 182. (Fall and spring)

166 **International Marketing Management** (3) Robles, Riddle, Kirca
Introduction to international marketing analysis and strategy, and the dynamic nature of international markets. Analysis of different types of international markets and formulation of initial entry strategies. Prerequisite: BAdm 110, 145 or Econ 181 or 182. (Fall and spring)

168 **Foreign Market Analysis** (3) Robles, Teegen
Project course involving global market research for target market selection, market entry strategy and in-country marketing plan development and financial implications of recommended global marketing strategy. Focus on consulting process as ancillary component. Prerequisite: IBus 160, 166.

171 **International Business Finance** (3) Rehman, Yang, Click, Dastidar, Ayyagari
Analysis of the international economic environment and its influence on corporate financial management of international operations. Prerequisite: BAdm 115, 145 or Econ 181 or 182. (Fall and spring)

173 **International Banking** (3) Rehman
Theory and practice of international banking; analysis of international commercial and investment banking from a management perspective; subjects include current international monetary and financial environment, money and capital markets, and topical problems of international banking from a management perspective. Prerequisite: IBus 171.

175 **International Monetary and Financial Issues** (3) Askari, Rehman, Yang, Dastidar
International macro and micro issues of money, banking, and finance examined from a management perspective. Topics include globalization, international monetary systems, Eurocurrency markets, LDC debt crises, and the role of the IMF and the World Bank. Prerequisite: IBus 171 or permission of instructor.

190 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods.

199 **Independent Study** (arr.)
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall and spring)

ITALIAN

See **Romance Languages and Literatures.**

JAPANESE

See **East Asian Languages and Literatures.**

JOURNALISM

See **Media and Public Affairs.**

JUDAIC STUDIES

Committee on Judaic Studies
M.E. Saperstein (*Director*), N. Brown, E. Cline, J. Cohen, P. Duff, R. Eisen, A. Etzioni, L. Jacobson, Y. Moses, F. Moskowitz, Y. Peleg, B. Reich, W. Reich, M. Ticktin

Columbian College of Arts and Sciences offers an interdisciplinary program in Judaic studies leading to the degree of Bachelor of Arts. This program is intended for students who wish to investigate the history, language, literature, religious and philosophical thought, and political and social experience of the Jewish people from the perspective of several academic disciplines. (Students who wish to concentrate on the religious aspects of Judaism and its relationship to the other religious traditions of the world may prefer to elect a major in religion with an emphasis on Judaism [see Religion].) Students who have studied abroad should verify the residence requirements of Columbian College of Arts and Sciences.

Bachelor of Arts with a major in Judaic studies—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses for the major (43 credit hours):

(a) Hebr 1–2, 3–4; Hist 113 or 114 or 115; Hist 158 or approved equivalent; Rel 9 or Hist 108; Rel 106 or 107; PSc 176 or 179.

(b) Two courses in literature; may be in Hebrew, including Hebr 103, 104, 120–21, or in translation, including Clas 100, 101, 102.

(c) Two courses selected from the list below; substitutions are permitted with the approval of an advisor designated by the Committee on Judaic Studies.

Minor in Judaic studies—Required: Hebr 1–2 and a minimum of 12 credit hours, chosen in consultation with an advisor designated by the Committee on Judaic Studies, from the courses listed below. (Of the 12 credit hours, at least 6 must be taken at GW and at least 6 must be in courses other than Hebrew language study.)

Anth 188	*Archaeology of Israel and Neighboring Lands*
Clas 100	*Modern Hebrew Literary Classics*
Clas 101	*Israeli Society and Culture: Literary Perspectives*
Clas 102	*Contemporary Israeli Short Stories and Poetry*
Engl 188	*Jewish American Writing*
Hebr 1–2	*Beginning Hebrew*
Hebr 3–4	*Intermediate Hebrew*
Hebr 103	*Modern Hebrew Nonfiction*
Hebr 104	*Modern Hebrew Fiction*
Hebr 106	*The Israeli Media*
Hebr 120–21	*Advanced Hebrew Literature*
Ydsh 1–2	*Yiddish for Reading and Conversation*
Hist 108	*History of Ancient Israel*
Hist 113	*History of the Jews in Christian Europe to the 18th Century*
Hist 114	*History of the Jews in Islamic Lands*
Hist 115	*Messianic Movements and Ideas in Jewish History*
Hist 158	*Modern Jewish History*
Hist 159	*The Holocaust*
Hist 161	*Jewish Historical Writing*
Hist 292	*Israel, Zionism, and the Arab World*
PSc 176	*The Arab–Israeli Conflict*
PSc 179	*Israeli Politics and Foreign Policy*
Rel 9	*Bible: Hebrew Scriptures*
Rel 103	*The Prophets*
Rel 106	*Judaism*
Rel 107	*Rabbinic Thought and Literature*
Rel 112	*Jewish Mysticism*
Rel 113	*Early Post-Biblical Judaism*
Rel 115	*Jewish Philosophy in the Medieval Period*
Rel 118	*Women in Judaism*
Rel 116	*Modern Jewish Thought*
Rel 123	*Issues in Jewish Ethics*
Rel 134	*The Holocaust in Theology and Literature*
Rel 174	*American Judaism*

KOREAN

See **East Asian Languages and Literatures.**

LATIN

See **Classical and Semitic Languages and Literatures.**

LATIN AMERICAN AND HEMISPHERIC STUDIES

Program Committee: J. Ferrer (*Director*), C.J. Allen, M. Byrnes, K. Healy, P.F. Klarén, C. McClintock, T. O'Keefe, M. Price, I. Vergara, W. Waters

The Elliott School of International Affairs offers a multidisciplinary program leading to a Bachelor of Arts with a major in Latin American and hemispheric studies.

Bachelor of Arts with a major in Latin American and hemispheric studies—The following requirements must be fulfilled.

1. The general curriculum requirements stated under the Elliott School of International Affairs.
2. Required courses for the major—IAff 90; Econ 185; PSc 183, 184; Geog 161; two courses chosen from Hist 162, 163, 164, 165; one course chosen from Anth 170, 172, 185, 186; one approved course in Spanish-American literature.
3. Six credit hours of related course work must be taken in anthropology, art history, economics, geography and regional science, history, international affairs, political science, and/or Hispanic literature.
4. Completion of third-year–level language study in Spanish (Span 10) or another approved foreign language.

Special Honors—In addition to the general requirements stated under University Regulations, a candidate for Special Honors in Latin American and hemispheric studies must have attained a 3.4 grade-point average overall and complete either an Elliott School or Honors senior seminar, or an Honors senior thesis or a major independent study research project approved by the program director. Students must apply for honors candidacy prior to the beginning of the senior year.

Students should consult the program guidelines available from the Elliott School for courses pertinent to Latin American and hemispheric studies. Students should consult the program director concerning certain Special Topics or Selected Topics courses that may also be part of this program.

LIBERAL ARTS

Advisor H. Yeide

Bachelor of Arts: Program in the Liberal Arts—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. *Writing*—7 credit hours from UW 20, Engl 100, 101, 111, and/or creative writing courses.
3. *Quantitative and Logical Reasoning*—6 credit hours (see Category 2 under Columbian College of Arts and Sciences General Curriculum Requirements).
4. *Natural Sciences*—12 credit hours selected from at least two of the following fields: biology (including biological anthropology), chemistry, geology, and physics (including astronomy).
5. *Social and Behavioral Sciences*—12 credit hours: (a) 6 hours selected from anthropology (except biological anthropology), geography, psychology, and/or sociology; and (b) either 6 hours of economics or 6 hours of political science.
6. *The Arts*—3 credit hours selected from fine arts, creative writing, dance performance, electronic media performance, applied music (jazz performance, a single instrument, or a single ensemble), and theatre performance. A creative writing course may count for either this requirement or the Writing requirement but not both.
7. *Literature*—12 credit hours of which 6 hours are a survey or sequence in English literature and 6 hours are selected from literature courses (in either a natural language or translation) offered by the foreign language departments, the Department of Religion, or the University Honors Program. Some courses may count for either this requirement or the Humanities requirement but not both.

8. *Humanities*—15 credit hours: (a) 6 hours selected from American studies, history, and/or women's studies; (b) 6 hours selected from classics, humanities, philosophy, religion, or honors (with approval of the advisor); (c) 3 hours selected from art history, music, or theatre and dance.

9. *Foreign Language*—6 credit hours beyond the second-year sequence.

10. A minimum of 36 credit hours must be taken in approved 100-level liberal arts courses (with a grade of *C*– or better).

Special Honors—In addition to the general requirements stated under University Regulations, in order to be considered for graduation with special honors, a student must maintain a cumulative 3.5 grade-point average in all courses taken at GW and earn an *A* in at least six of the 12 required 100-level liberal arts courses.

Because this program allows considerable flexibility, a student should consult the advisor frequently to ensure that requirements are being addressed and that the planned program best meets the student's evolving interests and needs. The major in Liberal Arts may be combined with a second major. See Interdisciplinary Programs under Columbian College of Arts and Sciences for a general description of this program.

LINGUISTICS

Committee on Linguistics
L. Bland, S. Hamano, Y.-K. Kim-Renaud, J. Kuipers, R.M. Robin

Columbian College of Arts and Sciences offers an interdepartmental program in linguistics. The purpose of the program is to provide a systematic treatment of the central issues in linguistics through courses taught under the auspices of the program and through other departments in Columbian College.

Minor in linguistics—15 credit hours of courses in linguistics, including Ling 101 and four courses from the following groups. Psycholinguistics—Ling 102. Applied Linguistics—Chin 123–24; SpHr 130, 131. Biological Foundations of Language—SpHr 102, 103. Sociolinguistics—Anth 161, 162; Phil 214 (with permission of instructor). Academic advising about the minor in linguistics is available from any member of the Committee on Linguistics.

101 **Language and Linguistic Analysis** (3) Staff
Development of a fundamental understanding of the nature of language and its components, including phonology, morphology, syntax, semantics, and pragmatics. Discussion of major approaches, principles, and concerns in the field of linguistics. Same as Anth 168. (Spring)

102 **Psycholinguistics** (3) Staff
Language as species-specific property of the human mind. Psychological processes involved in the encoding and decoding of language; first and second language acquisition and bilingualism. Same as Anth 163. (Spring)

MANAGEMENT SCIENCE

Professors W.E. Halal, E.H. Forman, S.A. Umpleby, E.K. Winslow, J.H. Carson, P.W. Wirtz, E.J. Cherian (*Chair*), J.H. Perry, P.K. Bagchi, J.P. Coyne, R. Soyer, M.J. Granger, J. Bailey, E.G. Carayannis, P.M. Swiercz
Associate Professors T.J. Nagy, R.G. Donnelly, W.H. Money, D.L. Zalkind, J. Artz, L. Williams, S.Y. Prasad, M.M. Tarimcilar, P. McHugh, S. Kanungo, T. Glickman, C. Goldberg, M.A. Gowan, S. Dasgupta, G.T. Solomon
Assistant Professors J. Feinstein, F.T. Anbari, D.F. Cioffi, Y.H. Kwak, R.A. Lumley, T.H. Rosen, S. Serich, P. Weiss, M.M. Hammad, N.M. Brenner, H. Khamooshi, V. Sahasrabudhe, D.C. Kayes, M.D. Haddad, S.C. White, T.M. Nielsen, M.E. Matta
Adjunct Associate Professor C.N. Toftoy
Professorial Lecturers E. Marits, D. Harris, D. Karlgaard, P. Oliver
Associate Professorial Lecturers C.A. Gruel, J. Barker, C.O. Bevis, S.M. Barry-Oliver, C.V. Feudo, J.P. Sagi, M.J. Spina, J.A. Williams

See the School of Business for programs of study leading to the degree of Bachelor of Business Administration.

107 **Fundamentals of Behavioral Science** (3) Winslow, Bailey
Survey of behavioral science research and practice as related to management. Emphasis on the basic human processes that contribute to the functioning of organizations. (Fall and spring)

110 **Applied Human Resource Management** (3) McHugh, Swiercz
The labor force and labor markets. The legal environment of human resource management. Human resource planning; employee recruiting, selection, training, development, compensation, motivation, discipline, health and safety. Prerequisite: BAdm 130.

115 **Leadership** (3) Swiercz
Leadership in organizations and in society. Consideration of whether leadership is a personal trait or a structured behavior and whether it is universal across domains or situation specific. Modern and historical examples; issues of leadership in popular contexts. Prerequisite: BAdm 130. (Fall)

116 **Advanced Topics in HRM** (3) Goldberg, Swiercz
Advanced examination of contemporary practices in human resource management, including recruitment and selection, training and development, performance appraisal, compensation and benefits, and employee relations. Student interaction with practitioners through field experiences, case analyses, and experiential exercises. Prerequisite: BAdm 130; Mgt 117. (Spring)

117 **Labor Relations, Negotiation, and Conflict Resolution** (3) McHugh
Introduction to labor–management relations. Labor law; economic, social, and public policy implications of collective bargaining; negotiation and conflict resolution in union and non-union workplaces. Prerequisite: BAdm 130. (Fall)

119 **Introduction to Structured Programming** (3) Brenner
For students already familiar with basic computer concepts, who will learn a programming language, such as Visual Basic, useful for business applications. Emphasis on computer applications in accounting and management information systems through hands-on programming. Prerequisite: BAdm 64. (Fall and spring)

120 **Structured Development with CASE** (3) Dasgupta, Granger
Analysis, design, and implementation of management information systems (MIS). Structured methodologies and techniques for various stages of the MIS development process. Computer-aided software engineering tools. May be taken for graduate credit with permission of program director and instructor. Prerequisite: Mgt 119 or permission of instructor. (Fall and spring)

121 **Database Design and Applications** (3) Granger, Dasgupta
Theory, architecture, and implementation of database management systems in corporate and organization information systems. Fundamental concepts of database management and processing. Expert database systems. Hands-on experience with database management packages. Prerequisite: Mgt 119 or permission of instructor. (Spring)

123 **Business Data Communications** (3) Prasad, Dasgupta
A technical overview of data communication concepts that are useful in the design and management of local and wide area networks. Internet technologies and their business applications are emphasized. Prerequisite: BAdm 64. (Spring)

190 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

192 **Small-Business Management** (3) Toftoy
Theory and practice of small-business management. Focus on effective management of small firms, essentials of planning and organizing the firm, financial and administrative controls. Evaluation of alternative business forms: purchase of an ongoing firm, franchising, and new business start-ups. (Fall and spring)

193 **New Venture Tactical Planning** (3) Toftoy, Carayannis
Development of a comprehensive business plan based on a feasibility study. Prerequisite: Mgt 192. (Fall)

194 **Product Development and Venturing** (3) Toftoy, Carayannis
Students form entrepreneur teams to develop new products. Prerequisite: Mgt 192 or permission of instructor. (Spring)

199 **Independent Study** (3) Staff
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall, spring, and summer)

MARKETING

Professors S.F. Divita (*Chair*), R.F. Dyer, P.A. Rau, R.S. Achrol, L.M. Maddox, S.S. Hassan
Associate Professors M.L. Liebrenz-Himes, A.K. Smith
Assistant Professor V. Perry

See the School of Business for programs of study leading to the degree of Bachelor of Business Administration.

Departmental prerequisite: BAdm 110 is prerequisite to all courses in the Marketing Department.

142 **Consumer Behavior** (3) Hassan and Staff
Social, cultural, and psychological factors influencing the behavior of consumers. Models of buyer behavior, consumption patterns, market segmentation, attitude formation and change, brand loyalty, adoption of innovations, and store choice decisions. Marketing management and public policy implications of consumer research. (Fall and spring)

143 **Marketing Research** (3) Rau and Staff
Basic methods and techniques of market research. Designing a marketing research project: research questions, secondary and syndicated data, primary data collection approaches, data analysis and report presentation. Focus group interviews, questionnaire construction, statistical software packages. Prerequisite: BAdm 54, Stat 51. (Fall and spring)

148 **Advertising** (3) Maddox
Planning an advertising campaign. Consumer and market information, message appeals, media selection and scheduling, measuring effectiveness. Current criticism and regulation of the advertising function. Other major marketing communication tools, including personal selling and sales promotion. Prerequisite: Mktg 142. (Fall)

149 **Advanced Advertising Campaigns** (3) Maddox
Participation in the National Student Advertising Competition. Research, media planning, copywriting, layout/design. Travel to competition site. Prerequisite: BAdm 110 and permission of instructor; corequisite: Mktg 199. (Spring)

150 **Salesmanship and Sales Management** (3) Staff
Development of personal selling and presentation skills; examination of types of selling situations. Organization of sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. (Fall and spring)

152 **Retailing Management** (3) Staff
A study of retailing management and strategy covering the current environment of retailing, retail market and financial analysis, store location and design, inventory management, and non-store and service retailing. Industry executive and student presentations and case analyses. (Fall)

159 **Marketing: Strategic Planning** (3) Dyer, Liebrenz-Himes, Rau
The capstone course for marketing majors. Analytical integration of material covered in previous marketing courses. Marketing strategy literature, financial dimensions of marketing decisions, and comprehensive cases. Prerequisite: Mktg 142, 143, 148 or 150, and one additional marketing major field course. (Fall and spring)

190 **Special Topics** (3) Staff
Experimental offering: new course topics and teaching methods.

199 **Independent Study** (arr.)
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall and spring)

MATHEMATICS

Professors H.D. Junghenn, I.I. Glick, M.M. Gupta, E.A. Robinson, F.E. Baginski, D.H. Ullman (*Chair*), J. Przytycki, J. Bonin, V. Harizanov
Associate Professors M. Moses, Y. Rong, W. Schmitt
Assistant Professors L. Abrams, Y. Taylor, I. Yi, K. Gurski

Bachelor of Arts with a major in mathematics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Math 21 or 31, and Math 32 and 33.
3. Required courses in the major—a minimum of 27 additional credit hours of approved 100-level courses in mathematics, including Math 121, 124, 139, 140, and either Math 122 or 125.

Bachelor of Science with a major in applied mathematics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Math 21 or 31, and Math 32 and 33.
3. Required courses in the major—a minimum of 27 additional credit hours of approved 100-level courses in mathematics, including Math 124, 139, 142, 143, and either Math 153 or 157.
4. Required courses in a related area—12 additional credit hours, to be selected in consultation with a departmental advisor, from a related area such as statistics, computer science, physics, engineering, chemistry, biology, economics, or applied science. At least 6 of these hours must be chosen from courses at the 100 level or higher.

Special Honors—To graduate with Special Honors, a student must meet the general requirements stated under University Regulations; maintain a grade-point average of at least 3.5 in mathematics courses; enroll in 3 credit hours of Math 195 in addition to the 27 credit hours of required courses in the major; and present an oral defense of a senior thesis prepared for Math 195.

Minor in mathematics—18 hours in mathematics courses, of which at least 12 are at the 100 level or higher, chosen in consultation with a departmental advisor.

With permission, graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Note: Math 21, 31, and 52 are related in their subject matter, and credit for only one of the three may be applied toward a degree. Some courses require a placement examination in lieu of a course prerequisite. This examination is offered by arrangement with the Department of Mathematics.

3 **College Algebra** (3) Staff
Equations and inequalities, functions and graphs, polynomial and rational functions, exponential and logarithmic functions, systems of equations.

6 **Trigonometry** (3) Staff
Right triangles, trigonometric functions and their graphs. Trigonometric identities. Polar coordinates. Prerequisite: Math 3 or the placement examination. (Offered via distance education only)

7 **Mathematics and Politics** (3) Staff
A mathematical treatment of fair representation, voting systems, power, and conflict. The impossibility theorems of Balinsky and Young and of Arrow. The electoral college. The prisoner's dilemma. (Fall)

9 **Mathematical Ideas I** (3) Staff
Mathematics of social choice. Scaling and fractals. Chaos and symmetry.

10 **Mathematical Ideas II** (3) Staff
Elementary graph theory, scheduling. Probability theory.

20–21 **Calculus with Precalculus I–II** (3–3) Staff
An introduction to single-variable calculus (differentiation and integration of algebraic and trigonometric functions with applications), with the concepts and techniques of precalculus developed as needed. Prerequisite to Math 20: Math 3 or the placement examination or a score of 560 or above on the SAT II in mathematics; Math 20 is prerequisite to Math 21.

30 **Precalculus** (3) Staff
Equations, inequalities, and functions. Properties of polynomial, trigonometric, logarithmic, and exponential functions. Prerequisite: the placement examination or a score of 560 or above on the SAT II in mathematics. (Offered via distance education only)

31 **Single-Variable Calculus I** (3) Staff
Limits and continuity. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite: Math 6 or 30 or the placement examination or a score of 720 or above on the SAT II in mathematics.

32 **Single-Variable Calculus II** (3) Staff
The calculus of exponential and logarithmic functions. L'Hopital's rule. Techniques of integration. Infinite series and Taylor series. Polar coordinates. Prerequisite: Math 21 or 31.

33 **Multivariable Calculus** (3) Staff
Partial derivatives and multiple integrals. Vector-valued functions. Topics in vector calculus, including line and surface integrals and the theorems of Gauss, Green, and Stokes. Prerequisite: Math 32.

51 **Finite Mathematics for the Social and Management Sciences** (3) Staff
Systems of linear equations, matrix algebra, linear programming, probability theory, and mathematics of finance. Prerequisite: Math 3 or the placement examination or a score of 560 or above on the SAT II in mathematics.

52 **Calculus for the Social and Management Sciences** (3) Staff
Differential and integral calculus of functions of one variable; applications to business and economics. Prerequisite: Math 3 or the placement examination or a score of 560 or above on the SAT II in mathematics.

91 **Introductory Special Topics** (1 to 3) Staff
Admission by permission of instructor. May be repeated for credit.

101 **Introduction to Mathematical Logic** (3) Harizanov, Moses
Symbolic logic as a precise formalization of deductive thought. Logical correctness of reasoning. Formal languages, interpretations, and truth. Propositional logic and first-order quantifier logic suited to deductions encountered in mathematics. Prerequisite: Math 32 or permission of instructor.

102 **Axiomatic Set Theory** (3) Harizanov, Moses
Cantor's theory of sets. Russell's paradox. Axiomatization of set theory as a framework for a contradiction-free mathematics. Finite, countable, and uncountable sets; ordinal and cardinal numbers; the axiom of choice. Prerequisite: Math 32 or permission of instructor.

103 **Computability Theory** (3) Harizanov, Moses
The unlimited register machine as a model of an idealized computer. Computable functions, Church's thesis. Effective enumerability. Unsolvability of the halting problem and other theoretical limitations on what computers can do. Prerequisite: Math 32 or permission of instructor.

106 **Introduction to Topology** (3) Rong, Taylor
Metric spaces: completeness, compactness, continuity. Topological spaces: continuity, bases, subbases, separation axioms, compactness, local compactness, connectedness, product and quotient spaces. Prerequisite: Math 33 and 124 or permission of instructor.

113 **Introduction to Combinatorics** (3) Bonin, Ullman, Schmitt
Introduction to combinatorial enumeration and partially ordered sets. Basic counting techniques, inclusion–exclusion principle, recurrence relations, generating functions, pigeonhole principle, bijective correspondences, and applications to computer science, optimization, and coding theory. Prerequisite: Math 32.

120 **Elementary Number Theory** (3) Bonin, Robinson
Divisibility of integers, prime numbers, greatest common divisor, the Euclidean algorithm, congruence, the Chinese remainder theorem, number theoretic functions, Möbius inversion, Euler's phi function, primitive roots and indices, and applications to cryptography and primality testing. Prerequisite: Math 31.

121 **Introduction to Abstract Algebra** (3) Abrams, Schmitt
Study of groups and associated concepts, including Lagrange's theorem, Cayley's theorem, the fundamental theorem of homomorphisms, and applications to counting. Prerequisite: Math 32 and 124 or permission of instructor.

122 **Introduction to Abstract Algebra II** (3) Abrams, Schmitt
Study of rings, through maximal and prime ideals, and the study of fields, through Galois theory. Prerequisite: Math 121.

124 **Linear Algebra I** (3) Robinson, Ullman
Linear equations, matrices, inverses, and determinants. Vector spaces, rank, eigenvalues, and diagonalization. Applications to geometry and ordinary differential equations. Prerequisite: Math 21 or 31, or 51 and 52, or permission of instructor.

125 **Linear Algebra II** (3) Abrams, Yi
Theory of vector spaces, linear transformations, and matrices. Quadratic and bilinear forms. Characteristic polynomials and the Cayley–Hamilton theorem. Similarity and Jordan canonical form. Prerequisite: Math 124.

132 **Introduction to Graph Theory** (3) Bonin, Ullman
Fundamental concepts, techniques, and results of graph theory, including applications to operations research, computer science, chemistry, and the social sciences. Topics include trees, connectivity, traversability, matchings, coverings, colorability, planarity, networks, and Polya enumeration. Prerequisite: Math 21 or 31.

135 **Projective Geometry** (3) Bonin
Projective spaces, projectivities, conics, pairs and pencils of conics, finite planes, coordinates, collineation, Desarguesian planes. Prerequisite: Math 120 or 121 or permission of the instructor.

139 **Advanced Calculus I** (3) Junghenn, Ullman
A rigorous study of differentiation, integration, and convergence. Topics include sequences and series, continuity and differentiability of real-valued functions of a real variable, the Riemann integral, sequences of functions, and power series. Prerequisite: Math 33 and 124 or permission of instructor.

140 **Advanced Calculus II** (3) Junghenn, Ullman
Continuation of Math 139. Topics include: topology of R^n, derivatives of functions of several variables, inverse and implicit function theorems, multiple integrals, generalized Stokes's theorem. Prerequisite: Math 139 or permission of instructor.

142 **Ordinary Differential Equations** (3) Gupta, Gurski
A first course in ordinary differential equations with an emphasis on mathematical modeling: solution curves, direction fields, existence and uniqueness, approximate solutions, first and second order linear equations, linear systems, phase portraits, and Laplace transforms. Prerequisite: Math 32 and 124 or permission of instructor.

143 **Partial Differential Equations** (3) Baginski, Gurski
A first course in partial differential equations: Fourier series and separation of variables, vibrations of a string, Sturm–Liouville problems, series solutions, Bessel's equation, linear partial differential equations, wave and heat equations, separation of variables. Prerequisite: Math 33 and 124 or permission of instructor.

148 **Differential Geometry** (3) Baginski, Robinson, Taylor
Curves in space, regular surfaces, tensors, fundamental forms of a surface. Gauss–Bonnet theory, minimal surfaces. The geometry of the Gauss map. Prerequisite: Math 33 and 124 or permission of instructor.

153 **Introduction to Numerical Analysis** (3) Baginski, Gupta
Accuracy and precision. Linear systems and matrices. Direct and iterative methods for solution of linear equations. Sparse matrices. Solution of nonlinear equations. Interpolation and approximate representation of functions, splines. Prerequisite: Math 33 or 124 and some knowledge of computer programming.

157 **Introduction to Complex Variables** (3) Glick, Junghenn
Analytic functions and power series. Contour integration and the calculus of residues. Conformal mapping. Physical applications. Prerequisite: Math 33 and 124 or permission of instructor.

170 **Computational Complexity** (3) Harizanov, Moses
Deterministic and nondeterministic Turing machines. Partial recursive functions and the Church–Turing thesis. Undecidable problems. Space and time complexity measures. Gap, speed-up, and union theorems. Decidable but intractable problems. The traveling salesman problem and other NP-complete problems. Prerequisite: Math 32 or permission of instructor.

181 **Seminar: Topics in Mathematics** (3) Robinson and Staff
Each offering of this course focuses on a particular aspect of mathematics. Past topics have included computational mathematics, fractals; network flows and combinatorial optimization; information theory and coding theory; dynamical systems; queuing theory. May be repeated for credit with permission. Prerequisite: Math 33 and 124 or permission of instructor.

191 **Special Topics** (arr.)
Admission by permission of instructor. May be repeated for credit.

195 **Reading and Research** (arr.)
Under the personal direction of an instructor. Limited to mathematics and applied mathematics majors with demonstrated capability. Prior approval of instructor required. May be repeated for credit.

MECHANICAL AND AEROSPACE ENGINEERING

Professors M.K. Myers (*Chair*), R.E. Kaufman, C.M. Gilmore, J.L. Whitesides, C.A. Garris, J.D.-Y. Lee, T. Tong, P.A. Cooper (*Research*), Y.-L. Shen
Associate Professors C. Mavriplis, A.D. Cutler, R. Mittal
Assistant Professors D.F. Chichka, R.R. Vallance, K.-J. Lu
Adjunct Professors B.W. Hannah, P. Matic
Professorial Lecturers J.A. Sprague, C.R. Hauer, S.M. Joshi, J. Juang, I. Raju, J.W. Edwards, G.C. Everstine, A.R. Johnson, J. Sobieski, E.L. Marsh, R.C. Blanchard
Associate Professorial Lecturers T.K. O'Brien, A. Auslander, J.K. Soldner, S.S. Dodbele, J.H. Milgram
Assistant Professorial Lecturer M.A. Busby

See the School of Engineering and Applied Science for the programs of study leading to the Bachelor of Science with a major in mechanical engineering.

1–2 **Introduction to Mechanical and Aerospace Engineering** (1–1) Jones
Careers in mechanical and aerospace engineering and the necessary academic program. Teamworking and problem-solving skills for solution of design problems. Analytical and design problems and correlations between academic skills and the mechanical and aerospace engineering professions. Participation in student competitions. (Academic year)

4 **Engineering Drawing and Computer Graphics** (3) Shen
Introduction to technical drawing, including use of instruments, lettering, geometric construction, sketching, orthographic projection, section and auxiliary views, dimensioning, pictorial drawing, and intersections and developments. Introduction to computer graphics, including topics covered in manual drawing, and computer-aided drafting. (Fall and spring)

117 **Engineering Computations** (3) Mavriplis and Staff
Numerical methods for engineering applications. Methods for solving systems of linear equations, root finding, curve fitting, and data approximation. Numerical differentiation and integration and numerical solution of differential equations. Computer applications. Prerequisite: CSci 49 or 50. (Spring)

120 **Methods of Engineering Experimentation** (2) Jones and Staff
Acquisition and analysis of experimental data. Laws of modeling and simulation. Report formulation and presentation. Basic principles of measuring instruments and sensors. Fundamentals of digital data acquisition and use of computer-based data systems. Strain gages, oscilloscopes, transducers, and computerized data systems. Prerequisite: MAE 117. (Spring)

126 **Fluid Mechanics** (3) Garris, Mavriplis, Shames
Fluid properties, fluid statics, integral and differential formulations of conservation of mass, momentum, and energy. Bernoulli's equation. Dimensional analysis and similitude. Inviscid flow. Viscous flow. Experimental and computational methods in fluid mechanics. Prerequisite: ApSc 58. (Fall)

128 **Biomechanics I** (3)
Mechanical analysis of biological systems. Characterization of living tissue. Applications of statics, solid mechanics, kinematics, and elementary dynamics to the human musculoskeletal system. May be taken for graduate credit with approval of department. Prerequisite: ApSc 57, CE 120. (Spring)

129 **Biomechanics II** (3)
Mechanical analysis of physiological fluid dynamics. Application of fluid flow analysis techniques to cardiovascular, pulmonary, respiratory, and phonatory flows. Introduction to biomedical devices that manipulate physiological flows. May be taken for graduate credit with approval of department. Prerequisite: MAE 128. (Spring)

131 **Thermodynamics** (3) Staff
Fundamentals of equilibrium thermodynamics; Zeroth, First, and Second Laws. Work, heat, internal energy, enthalpy, thermodynamic potential functions; heat transfer mechanisms, phase diagrams, equations of state and property tables, power systems, refrigeration, heat pump systems. Reversible and irreversible processes, Carnot cycle, entropy, exergy. Prerequisite: Phys 21. (Spring)

134 **Introduction to Vibration Analysis** (3) Garris, Lee
Natural frequencies, free vibration, forced vibration. Unbalance, whirling, vibration isolation. Measuring techniques and application of computers in vibration

analysis. Multiple degrees of freedom. Dynamic vibration absorbers. Shock and transient vibration. Prerequisite: ApSc 58. (Spring)

145 **Orbital Mechanics and Spacecraft Dynamics** (3) Chichka
Coordinate systems and transformations, rocket equation, two-body problem, orbit transfers, orbit perturbations, attitude dynamics and stability of symmetric spacecraft, environmental and control torques. (Fall)

149 **Thermal Systems Design** (3) Staff
Completion of a thermal systems design project that requires integration of engineering science, economics, reliability, safety, ethics, professional responsibility, and social considerations. Development and use of design methodology, optimization, feasibility considerations, detailed system descriptions, and presentation of results. Prerequisite: MAE 187. (Fall)

152 **Mechanical Engineering Laboratory** (2) Garris and Staff
Project-oriented course. Simulates working environment of professional engineers. Projects are assigned in student's areas of interest; student is expected to design and assemble own experiments. Extensive use of instrumentation and computing facilities. Project proposal, progress reports, final report, and periodic oral presentations required. Prerequisite: MAE 120. (Spring)

155 **Aerodynamics** (3) Myers, Garris
Subsonic and supersonic aerodynamics: potential flow, lift and form drag, viscous effects, compressible flow. Prerequisite: MAE 126. (Spring)

157 **Aerodynamics Laboratory** (1) Staff
Subsonic and supersonic wind tunnel experiments and simulations. (Fall)

162 **Aerospace Structures** (3) Staff
Basic structural theory of lightweight aerospace structures. Development of shear and bending moment diagrams and stresses. Analysis of typical monocoque structures. External airloads and their distribution. Mechanical properties of metal and advanced composite structures. Design of members in tension, bending or torsion, and design of webs in shear. (Spring)

163 **Airplane Performance** (3) Staff
Lift and drag estimation methods. Airplane performance measures, such as range and endurance, turning flight, specific excess power and acceleration, takeoff and landing performance. Longitudinal and lateral-direction static and dynamic stability. Control surface effectiveness. (Fall)

166 **Materials Engineering** (2) Gilmore, Haque
Mechanical properties, plastic deformation dislocation theory, yielding, strengthening mechanisms, microstructure and properties, heat treatment of steel, composites, amorphous materials, viscoelastic deformation, creep, fracture, fatigue, fatigue crack propagation. Prerequisite: ApSc 130; concurrent registration: CE 120. Same as CE 166. (Fall)

167 **Mechanics of Materials Laboratory** (1) Gilmore, Haque
Measurement of strains and study of failure resulting from applied forces in ductile, brittle, anisotropic, elastomeric, plastic, and composite materials. Study of tension, compression, bending, impact, and shear failures. Prerequisite or concurrent registration: MAE 166. Same as CE 167. (Fall)

182 **Electromechanical Control System Design** (3) Lee
Application of control theory to the design of electromechanical systems. Transducers, valves, and other control components. Mathematical models of open- and closed-loop electromechanical systems. Root locus and frequency response methods; application to the synthesis of feedback systems by both manual and computer-aided techniques. Prerequisite: ApSc 114; MAE 117, 134. (Fall)

187 **Heat Transfer** (3) Staff
Steady- and unsteady-state heat conduction problems. Analytical and numerical solution methods. Convective heat transfer, boundary-layer approach, analogy between heat and momentum transfer. Thermal radiation; fundamental concepts and laws. Heat-exchanger design. Prerequisite: MAE 126, 131. (Spring)

190 **Analysis and Synthesis of Mechanisms** (3) Kaufman and Staff
Kinematics and dynamics of mechanisms. Displacements, velocities, and accelerations in linkage, cam, and gear systems by analytical, graphical, and computer methods. Synthesis of linkages to meet prescribed performance requirements. Prerequisite: ApSc 58. (Fall)

191 **Mechanical Design** (3) Kaufman and Staff
Integration of knowledge of strength of materials in a design context. Stresses and deflections in engineering structures. Theories of failure. Introduction to

the design of mechanical components, such as fasteners, shafts, springs. Introduction to the use of computers in mechanical engineering design. Prerequisite: CE 120, MAE 117. (Spring)

192 **Manufacturing Processes and Systems** (3) Shen and Staff
Introduction to manufacturing techniques for metals, polymers, ceramics, and composites. Relationships between properties of materials and techniques for processing them. Process selection, design, control, and integration. Computer-integrated manufacturing, robotics and assembly automation. Prerequisite: junior status or permission of instructor. (Fall)

193 **Engineering Systems Design** (3) Kaufman and Staff
Creative engineering design, problem definition, and concept generation. Design of journal and roller element bearings, fasteners and permanent joints, and springs. Design project incorporating design selection, and optimization. Project presentation using graphical and computer resources. Prerequisite: MAE 191. (Fall)

195 **Computer-Aided Engineering of Mechanical Systems** (3) Jones and Staff
Presentation of the major elements of computer-aided engineering systems: interactive computer graphics, finite element analysis, and design optimization. Consideration of economics, safety, and reliability factors. Prerequisite: MAE 193; concurrent registration: MAE 196. (Spring)

196 **Computer-Aided Engineering Laboratory** (1) Jones and Staff
Instruction and hands-on applications of computer-aided engineering systems to the design, analysis, and optimization of mechanical engineering components and systems. Concurrent registration: MAE 195. (Spring)

197 **Robotic Systems Design and Applications** (3) Staff
Modeling and analysis of robot designs. Kinematics, statics, and dynamics of linkages. Design and selection of mechanical structures, actuators, transmissions, and sensors. Design of robotic control systems. Relevant computer hardware and software. Industrial applications and limitations of robot systems. Lab experiments. Same as ECE 192. Prerequisite: MAE 182. (Spring)

198 **Research** (1 to 3) Staff
Applied research and experimentation projects, as arranged. Prerequisite: junior or senior status. (Fall and spring)

199 **Student Design Project** (1 to 3) Staff
Special student projects involving extensive design of various mechanical engineering systems. Examples include the solar car, mini-Baja, or other design competitions that typically are national in scope. May be taken for graduate credit by graduate students. (As arranged)

MEDIA AND PUBLIC AFFAIRS

Professors C.H. Sterling, J.B. Manheim, J.L. Folkerts, C. Stern, S.V. Roberts, S. Hess
Associate Professors J.E. Thiel, J.E. Steele, S.L. Livingston (*Interim Director*), L.S. Harvey, A.L. May III, L. Willnat, M. Feldstein, P.F. Phalen
Assistant Professors S. Keller, P.C. O'Brien, S. Aday, K.A. Gross
Professorial Lecturer L.B. Laurent
Associate Professorial Lecturers J.A. Echave, L.C. Francis, M.C. McAllister, A. Crowe
Lecturers R. Russell, J.M. Shanahan

Through the Columbian College of Arts and Sciences, the School of Media and Public Affairs offers programs of study leading to the Bachelor of Arts in the fields of journalism, political communication, and electronic media. Entering freshmen may be admitted to degree programs within the School of Media and Public Affairs through a competitive application process. This process is specified in application materials distributed by the Office of Admissions.

In addition, a limited number of students will be admitted through a competitive application process that begins after the student is accepted to the University. Students are encouraged to apply during the first semester of their sophomore year; applications are not accepted from students with more than 75 credit hours. Minimum requirements for admission include the completion of prerequisites with specified grades for each program and a minimum GPA of 3.0. Achievement of the minimum GPA does not guarantee admission. Once admitted to the University, students desiring to enter SMPA face a highly selective process. Contact directors of the programs for specific information and applications; program application requirements vary and in some cases include achieving specific

grades in certain courses and completion of an essay. Programs are listed below with their course offerings.

All students, both those admitted directly into SMPA and those applying after acceptance to GW, must achieve specified grades in some courses. Check with the program director for particular grade requirements and course sequencing.

All students enrolled in majors offered by the School of Media and Public Affairs must take SMPA 50, 51 and 199.

Five-Year Bachelor of Arts in an SMPA major and Master of Arts in the field of political management—Through Columbian College of Arts and Sciences, the School of Media and Public Affairs and the Graduate School of Political Management offer a joint five-year B.A./M.A. program in media and political management. Interested SMPA students should consult their program director and apply to the joint degree program during the second semester of their junior year.

SCHOOL OF MEDIA AND PUBLIC AFFAIRS

50 **Introduction to Media and Public Affairs** (3) Harvey, Keller, Livingston, Phalen, Steele
The historical and philosophical origins of contemporary communication, both as a significant aspect of public and private life and as a field of inquiry; the principal approaches to studying communication and the role of communication in the contemporary era.

51 **Research Methods** (3) Aday, Manheim, Willnat
Processes of inquiry within mediated communication. Students are introduced to concepts of framing research questions, conducting literature reviews, developing a research design, and interpreting results of cultural and social science research within a societal framework. Prerequisite: Stat 53.

125 **Forensics Practice (Debate)** (1) Keller
Participation in intercollegiate debate activities as a member of the GW varsity, junior varsity, or novice debate teams. In-depth research on the national intercollegiate debate resolution, practice rounds, and travel to debate tournaments. May be repeated for credit.

150 **International Communication** (3) Willnat
Major international news-gathering and broadcasting organizations, international communications policy forums, organizations and treaties, spectrum allocation criteria, communications technology, and trade in communication.

190 **Selected Topics** (1 to 4) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

199 **Senior Seminar** (3) Manheim, Sterling, Livingston, Harvey, Phalen, May, Steele
Capstone course limited to SMPA program majors. Selected reading and discussion with possible fieldwork. Students should consult program director regarding additional restrictions on enrollment.

JOURNALISM

Bachelor of Arts with a major in journalism—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Jour 111; SMPA 50. A grade of *B* or better in Jour 111 is required to remain in good standing in the program or to apply to the program.
3. Required courses in SMPA: SMPA 51 and 199.
4. Required courses in the major: Jour 100; 24 hours of 100-level courses, including Jour 112 and 150; 6 hours chosen from Jour 120, 121, 122, 123, 124; 3 hours chosen from Jour 130, 131, 132, 133, 134, 135; 3 hours chosen from Jour 123, 124, 140, 141, 142, 147, or EMda 75, 140; 3 hours chosen from Jour 151 or 152 or PCm 128; 3 hours chosen from any journalism course.
5. Required courses in related areas: Engl 51–52 or 71–72; 6 hours chosen from PSc 1, 2, 3, or Hist 71–72; plus an area of specialization consisting of a minor in another field or 18 hours of courses representing a cohesive area of study and approved by the advisor. If the second option is chosen, at least 12 hours must be at the 100 level. Minors or specializations must be in programs outside SMPA.

Minor in journalism—21 credit hours of journalism courses, including Jour 100, 111; 6 hours chosen from Jour 120, 121, 122, 123, 124, 130, 131, 132, 133, 134, 135; 3 hours from Jour 140, 141, 142, 147, or EMda 75, 140; and 3 hours from Jour 150, 151, or 152 or PCm 128.

Special Honors—Students with a 3.5 GPA in all courses completed at GW and in all courses required for the major may apply for special honors in journalism. A student intending to apply must consult with the journalism program director at the start of the senior year. Application must be made by the mid-point of the graduation semester (October 15 or March 15) and must include a letter of application and a portfolio of published or broadcast work. The work will be evaluated by the journalism faculty on the basis of professional standards as outlined by the program director.

100 **Journalism: Theory and Practice** (3) Aday, Steele
An overview of journalism in the United States. Introduces students to organizations and institutions of the American news media, outlines basic history and social context of American journalism, examines how news is constructed, and explores intellectual underpinnings of the occupational ideals and professional practices that guide journalism today.

111 **Reporting and Writing the News** (3) Staff
Fundamentals of news reporting and writing, with emphasis on the print media. News judgment, information gathering skills, and facility in crafting news and feature stories. Regular in-class and outside reporting and writing exercises. Directly admitted freshmen may enroll in their second semester; all other freshmen need departmental permission. Laboratory fee, $100.

112 **Advanced Reporting** (3) May
Reporting, writing, and computer skills for covering beats and developing in-depth news stories. Techniques in researching, observing, and interviewing to frame stories of public interest will be learned through outside and in-class reporting and writing assignments. Laboratory fee, $100. Prerequisite: Jour 111. Restricted to journalism majors or permission of instructor required.

120 **Editorial and Persuasive Writing** (3) Keller
Techniques of editorial and column writing; editorial page and public affairs programming; function of commentary in a free press. Prerequisite: Jour 111.

121 **Feature Writing** (3) Roberts
Development and writing of a wide range of feature articles, including interviews, profiles, op-ed columns, and personal memoirs. Emphasis on weekly writing assignments and practical experience, including marketing work to publications. Prerequisite: Jour 111.

122 **Broadcast News Reporting** (3) Feldstein
Preparation of radio and television scripts based on actual news events. Using workshop techniques, scripts are evaluated for content, structure and use of words, pictures and sound. Extensive use of network news reports. Prerequisite: Jour 111.

123 **Computer-Assisted Reporting** (3) Staff
Retrieving information from online sources and government databases, with emphasis on the ethical use and evaluation of data. Use of computer databases to analyze records and produce reliable and valid data for investigative news stories. Laboratory fee, $100. Prerequisite: Jour 111.

124 **News Online** (3) Staff
The examination and practice of journalism on the Internet with an emphasis on news writing and presentation, including web page design. Students are exposed to news standards, approaches to online writing, ethics, and issues of access on the web and introduced to production techniques. Prerequisite: Jour 111.

130 **Business and Technology Reporting** (3) Staff
Development of reporting and writing techniques in covering the world of money and work. The course explores how the media relate economic changes to the general public, and develops journalistic practices through exercises in writing and analyzing trends in broad range of topics, including business, banking, labor, and international trade. Prerequisite: Jour 111.

131 **Science/Medical Reporting** (3) Staff
Translating the worlds of science and medicine for a mass audience. Using in-class exercises and outside assignments, students will acquire reporting and

writing skills needed to understand and present complex topics to readers and viewers. Prerequisite: Jour 111.

132 **Campaign Reporting** (3) May
Developing news gathering and writing skills needed for the coverage of political campaigns. Using in-class exercises and outside assignments, students will acquire reporting and writing proficiency needed to illuminate how campaigns work and how politics affects the lives of citizens. Same as PCm 132. Prerequisite: Jour 111.

133 **Covering Court Decisions** (3) Stern
Primer for journalists on how the courts and the Constitution work and how to explain court rulings to the public. Emphasis on reading, reporting, and writing about U.S. Supreme Court decisions. Prerequisite: Jour 111.

134 **Washington Reporting** (3) May
Examination of reporting and writing techniques employed in news coverage of the national government, with an emphasis on serving a regional readership or audience. Using Washington as a laboratory, students focus on contemporary issues and news makers in the legislative and executive branches of government. Prerequisite: Jour 111.

135 **Critical Writing and Reviewing** (3) Laurent
Reviewing and commenting on the arts and entertainment for the mass media. Prerequisite: Jour 111.

140 **Photojournalism** (3) Echave
Elements of effective news and feature photos, including study and evaluation of slides taken by students. Picture selection, cropping, captions. Student costs include film and developing.

141 **Newspaper Editing and Design** (3) McAllister
Emphasis on newspaper design, editing, and layout. Selecting and editing stories; writing headlines and photo captions; selecting, sizing, and cropping photos and other graphic materials; laying out pages. Ethics of editing.

142 **Magazine Editing and Design** (3) Staff
Setting editorial goals; planning content and production to meet them. Editing copy; working with art directors. Layout, typography, and design for magazines, house organs, and similar publications for associations, institutions, and industry.

147 **Television Workshop** (3) Staff
Same as EMda 147.

150 **Media Law** (3) Stern
Freedom of the press, censorship, legislative controls, copyright, laws of libel and privacy, and business laws relating to the news business, privilege, and fair comment.

151 **Narrative Journalism** (3) Steele, May
An introduction to the narrative or story-telling tradition in journalism through readings, discussions, and writing exercises. Students are exposed to a wide range of readings, both historical and contemporary, and are encouraged to experiment with writing exercises in the genre.

152 **U.S. Journalism History** (3) Feldstein
History of American journalism, starting with the colonial period; political, social and economic developments. Media relations with government; the evolving concept of journalistic rights and responsibilities.

190 **Selected Topics** (3) Staff
Topic and fee, if charged, announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

196 **Independent Study** (1 to 6) May
The student pursues a program of directed reading, research, and writing under the direction of a faculty advisor. Limited to seniors. Permission of the program director required.

197 **Internship** (1 to 3) May
Students spend at least 5 hours per week per credit during the semester in an approved news organization performing work under the general direction of the journalism program director. Grades are assigned on a Pass/No Pass basis only. Restricted to juniors and seniors majoring or minoring in journalism. Permission of the program director required. May be repeated for up to 6 credits.

ELECTRONIC MEDIA

Bachelor of Arts with a major in electronic media—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses: SMPA 50; EMda 75.
3. Required courses in SMPA: SMPA 51 and 199.
4. Required courses in the major: EMda 100, 141; two courses chosen from EMda 143, 144, 145; and 18 additional hours of 100-level courses in electronic media (excluding EMda 197), as approved by the major advisor; 9 of these hours must be in the 180–89 sequence.
5. Required courses in related areas: 15 credit hours of 100-level courses in one other department, program, or field of study, as approved by the major advisor.

Minor in electronic media—EMda 75 or 140 (taken first); and 15 additional credit hours, including EMda 100, one course in the 170–79 sequence, one course in the 180–89 sequence, and two additional electronic media courses numbered above 100.

Special Honors—Students with a 3.5 GPA in all courses completed at GW and in all courses required for the major may apply for special honors in electronic media. A student intending to apply must consult with the electronic media program director at the start of the senior year. Application must be made by the mid-point of the graduation semester (October 15 or March 15) and must include a letter of application and a portfolio of original research or broadcast work. The work will be evaluated by the electronic media faculty on the basis of professional standards as outlined by the program director.

Note: For EMda 75, 140, 143, 144, 145, and 146, attendance on the first meeting day of the class is required because equipment and scheduling instruction is provided that will not be repeated.

75 **Sight and Sound** (3) Thiel
Development of a critical awareness of aural and visual communication through an introduction to the aesthetics, techniques, and organization of the creative process in electronic media. Lecture (2½ hours), laboratory (2 hours). Laboratory fee, $65. (Fall and spring)

100 **American Electronic Media** (3) Sterling, Phalen, and Staff
Study of the origins, structure, and nature of American broadcasting and related media. (Fall and Spring)

129 **Television and Politics** (3) Staff
Same as PCm/PSc 129.

140 **Production for Public Affairs** (3) Staff
Basic concepts of television as communication media; emphasis on design and production techniques, with applications in political communication. Laboratory fee, $75. (Fall and spring)

141 **Scriptwriting** (3) Harvey, Thiel, O'Brien
Study and practice of the forms, techniques, and types of writing for radio, television, and film. Prerequisite: Engl 11; EMda 75 for EMda majors; permission of instructor for non-majors.

143 **Digital Video Editing** (3) Staff
Theory and practical aspects of video editing. Analysis and editing exercises; film grammar. Prerequisite: EMda 75. Laboratory fee, $100.

144 **Sound Design** (3) O'Brien
Introduction to basic concepts of traditional audio and sound design as a creative communication medium; emphasis on design and technique for a variety of formats, including field production and nonlinear editing. Lecture (2 hours), laboratory (2 hours). Prerequisite: EMda 75. Laboratory fee, $100. (Fall and spring)

145 **Television Directing** (3) O'Brien and Staff
Basic concepts of video as a creative communication medium; design and technique, planning, and directing in a studio context. How a director coordinates all aspects of studio production. Lecture (1½ hours), laboratory (3 hours). Prerequisite: EMda 75. Laboratory fee, $100. (Fall and spring)

146 **Producing for Television** (3) Staff
Advanced study and practice of television producing and directing techniques. Studio and field production skills in developing television programs from orig-

inal concept to final product. Lecture (1½ hours), laboratory (3 hours). Prerequisite: EMda 143, 145, and permission of instructor. Laboratory fee, $100.

147 **Television Workshop** (3) Staff
Hands-on workshop designed to give simulated TV industry experience. Students work together to produce and direct a newsmagazine program. May be repeated once for credit. Prerequisite: Jour 111 (for journalism majors), EMda 145 (for electronic media majors). Laboratory fee, $100. Same as Jour 147.

171 **Language of Cinema** (3) Staff
Introduction to cinema as language through analysis of the components of film structure—camera, editing, sound, movement, music, dialogue, and mise-en-scène. Laboratory fee, $75.

173 **History of Cinema** (3) Staff
An examination of the history, structure, and theory of motion pictures in America and abroad. Same as AH 173. Laboratory fee, $75. (Fall)

174 **Special Studies in Film** (3) Staff
In-depth study of specific film topics. Prerequisite: EMda 173. Laboratory fee, $75. (Spring)

175 **The Political Image** (3) Staff
An analysis of the techniques of propaganda and rhetoric used in film and television to visualize political ideology. Laboratory fee, $75.
(Spring, even years)

176 **Film as Fact and Fiction** (3) Staff
A comparison of structural differences between documentary and fiction film in order to study how each presents different versions of reality. Laboratory fee, $75. (Spring, odd years)

180 **Electronic Media Policy** (3) Sterling
Legal, technical, political, economic, and social aspects of radio, television, and cable and related delivery systems. Structure and operation of the FCC and other agencies, plus the role of Congress and the courts. Spectrum allocation, behavioral regulation, the trend to deregulate political influence, and current policy issues. Prerequisite: EMda 100.

181 **Media Management** (3) O'Brien
Decision making, strategic planning, and daily operations of radio, television, and cable; programming and sales strategies, promotion, and impact of ratings and research. Prerequisite: EMda 100.

182 **Innovation in Electronic Media** (3) Harvey
Examination of current and likely future trends in electronic media, with emphasis on radio, television, and cable, including developments in technology, programming, and public policy and their cultural implications. Prerequisite: EMda 100.

183 **Development of American Electronic Media** (3) Sterling
The development of radio, television, cable, and newer media services: changing technologies; national and local industry structures and economics; program trends; audience research and impact; regulatory developments. Prerequisite: EMda 100.

185 **Comparative Communication Systems** (3) Willnat
In-depth study of the developmental, regulatory, political, economic, and cultural dimensions of selected foreign communication systems. Prerequisite: EMda 100.

186 **Commercialization of Broadcasting** (3) O'Brien
The commercialization of broadcasting and the social and cultural impact of the medium. Examination of the widely held belief that American culture has been shaped largely by the products and services, as marketed through broadcast outlets, that Americans consume. Prerequisite: EMda 100.

187 **Cultural Theory of Mass Media** (3) Harvey
The various ways in which cultural meaning becomes embedded in objects of the imagination, particularly as they manifest in the U.S. mass media. Prerequisite: EMda 100.

188 **Effects of Electronic Media** (3) Phalen and Staff
Concepts of the impact of broadcasting and related media on audiences; social science research findings and methods, including persuasion, formation of

opinion, media and personal interaction, the depiction of violence, audience characteristics and media use patterns, and development of related theories and models of mass communication. Prerequisite: EMda 100.

190 **Selected Topics in Electronic Media** (3) Staff
Topic and fee announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

196 **Independent Study** (1 to 3) Staff
Independent research and special projects. Before students are permitted to register, they must submit a written proposal of the plan of study and obtain approval of the faculty member who will be directing the study and of the program director.

197 **Internship** (1 to 3) Staff
Open to juniors and seniors in electronic media. Students spend at least 16 hours a week in an approved media position with a local nonprofit, corporate, or commercial organization. Seminar meetings, reports, and career-oriented projects. Admission requires an application and approval of the program director. Grades are Pass/No Pass only. May be repeated once for credit.

POLITICAL COMMUNICATION

Bachelor of Arts with a major in political communication—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses: SMPA 50; PSc 2 and either PSc 1 or 3; Psyc 1; Stat 53.
3. Required courses in SMPA: SMPA 51 and 199.
4. Required courses in the major: PCm 100; Psyc 156; Jour 111; and 18 hours of 100-level courses in political communication. PCm 100 should be taken in the second semester of the sophomore year; a grade of *C* or better is required. The 18 hours of 100-level courses in political communication may include EMda 140 and SMPA 150. With permission of the program director, seniors with a grade-point average of 3.0 or better may apply one course in the Graduate School of Political Management toward this requirement.
5. Required courses in related areas: 6 additional credit hours of 100-level political science courses, and 6 additional credit hours of 100-level courses from any other program in the School of Media and Public Affairs.

Special Honors—Students with a grade-point average of 3.7 or better in all course work completed at George Washington University and in all courses required for the major may declare for Special Honors at the beginning of the senior year. Students declaring for Special Honors take PCm 196 in the first semester of the senior year and SMPA 199 in the second semester. To achieve Special Honors, the student must maintain the stated GPA requirements and present a successful oral defense of a research paper prepared for the Senior Seminar before a committee that includes the Senior Seminar instructor and two other faculty members nominated by the student and approved by the program director.

100 **Introduction to Political Communication** (3) Manheim, Livingston, Willnat, Gross
Basic concepts and theories of political communication; development of a framework for analyzing political communication; applications in the United States, other countries, and the international system. Open only to political communication majors. Prerequisite: SMPA 50.

128 **Media, Politics, and Government** (3) Roberts
Exploration of the role played by communication, principally through the mass media, in the conduct of government and the making of public policy. Same as PSc 128.

129 **Television and Politics** (3)
Same as PSc/EMda 129.

132 **Campaign Reporting** (3) Staff
Same as Jour 132.

140 **Media and Foreign Policy** (3) Livingston
Emerging role of news media in international affairs and diplomacy, particularly as it relates to U.S. foreign policy. Globalization of the news media,

advances in instantaneous communications technologies, consequences for international diplomacy.

147 **Public Diplomacy** (3) Staff
The theory and practice of public diplomacy: informing, influencing, and establishing dialogue with international publics and institutions. A conceptual and historical examination of public diplomacy, current practices, and contemporary issues, including international information dissemination, educational and cultural exchange, and international broadcasting.

149 **Public Opinion, Media, and Democracy** (3) Gross
Key aspects of the literature on public opinion, with emphasis on the role of media in opinion formation and change. Topics include the meaning of public opinion in a democratic society, a review of methods used to measure opinion, and media effects on opinion.

150 **Principles of Public Relations** (3) Staff
Principles, problems, ethics, and law of public relations for government, private concerns, educational and other public institutions.

152 **Public Affairs and Government Information** (3) Staff
Aspects of information and public affairs functions of government agencies at all levels. Role of the information specialist. Writing and editing for government publications.

155 **Strategic Political Communication** (3) Manheim
Origins of strategic approaches to political communication; techniques. Use of strategic communication by individuals, groups, organizations, and governments in both domestic politics and policymaking and in the international system. Prerequisite: PCm 100 or permission of the instructor.

156 **Strategic Political Communication Practicum** (3) Manheim
Working in small groups, students research and develop full-scale plans for hypothetical, reality-based strategic communication campaigns that test and apply theoretical advances in the field. Prerequisite: PCm 155 and permission of the instructor.

157 **Political Campaign Communication** (3) Staff
Communication aspects of political campaigns for candidates and ballot issues. Examination of techniques and channels of communication, role of communication in campaign strategy, ethics and implications of campaign decision making.

158 **Political Campaign Advertising** (3) Keller
Introduction to the theory and practice of campaign advertising. Emphasis on televised political campaign spots, but a range of campaign advertising media are included: radio, direct mail, and the Internet.

170 **Political Debate** (3) Keller
Theory and practice of political debate. The campaign context, candidate strategies, debate issues, and debates and voter behavior. Participation in classroom debates.

171 **Political Oratory and Speech Writing** (3) Keller
Theory and practice of public speaking in the context of mediated political communication. Students analyze, write, and give speeches.

190 **Selected Topics** (3) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

196 **Independent Study** (1 to 6) Staff
The student pursues a program of directed reading or original research under the direction of a faculty advisor. Limited to seniors pursuing Special Honors in political communication. Before registering, the student must obtain approval of a written plan of study by the faculty member who will direct the study and by the program director.

197 **Field Experience** (3) Staff
Open to juniors and seniors majoring in political communication. Students spend at least 16 hours a week during the semester in an approved agency or office performing practical work in the subject under the general guidance of a faculty advisor. Grades are assigned on a Pass/No Pass basis only. May be repeated for credit once.

MIDDLE EASTERN STUDIES

Program Committee: N. Brown (*Director*), D. Khoury, L. Riddle, W. Reich

The Elliott School of International Affairs offers a multidisciplinary program leading to a Bachelor of Arts with a major in the field of Middle Eastern Studies.

Bachelor of Arts with a major in Middle Eastern studies—The following requirements must be fulfilled:

1. The general curriculum requirements stated under the Elliott School of International Affairs, including Hmn 8 as the foundation course.
2. Required courses for the major—(a) 6 credit hours selected from Hist 107, 108, 114, 115, 158, 193, 194; (b) 6 hours selected from PSc 176, 177, 178, 179; (c) 6 hours selected from Rel 9, 107, 112, 115, 161, 163, 164, 165; (d) 3 hours selected from Econ 136, 151, 181–82; (e) 3 hours selected from Arab 103, 104; Clas 81, 82, 100, 101; and Hebr 104, 120–21; 6 additional hours of course work related to the Middle East from any department, to be selected in consultation with the program director.
3. Completion of third-year–level language study in Arabic (Arab 10) or Hebrew (Hebr 106).

Special Honors—In addition to the general requirements stated under University Regulations, a candidate for Special Honors in Middle Eastern studies must have attained a 3.4 grade-point average overall and complete either an Elliott School or Honors senior seminar, or an Honors senior thesis or a major independent study research project approved by the program director. Students must apply for honors candidacy prior to the beginning of the senior year.

Students should consult the program guidelines available from the Elliott School for courses pertinent to Middle Eastern studies. Courses in addition to those listed may be substituted with permission of the program director. Students should consult the program director concerning certain Special Topics or Selected Topics courses that may also be part of this program.

MUSIC

Professors R.J. Guenther (*Chair*), L. Youens
Associate Professor K. Ahlquist
Assistant Professors B. Fritz, M.W. Mehaffey, D. Boyce
Adjunct Professor K. Lornell
Adjunct Associate Professors M. Garst (*Piano and Harpsichord*), M. Peris (*Piano*), R. Baker (*Voice*), R. Parnas (*Violin* and *Viola*), M. Sislen (*Guitar*), C.J. Pickar, J.D. Levy (*Jazz Improvisation*), L. Barnet (*Cello*)
Adjunct Assistant Professors J.E. White (*Voice*), J. Albertson (*Guitar*), F.B. Conlon (*Piano*), T. Konstantinov (*Piano*), R. Birch (*Trumpet*), M. Findley (*Violin*), J. Krash (*Chamber Music*)
Adjunct Instructors E. Guenther (*Pipe Organ*), B.R. Seidman (*Harp*), S. Wellman (*Voice*), P. Edgar (*Percussion*), S.M. Fearing (*French Horn*), M. Von Villas (*Opera*), J.C. Connell (*Percussion*), E. Waters (*Guitar*), L. Gilliam (*Recorder*), P. Fraize (*Jazz Performance/Saxophone*), R. Couto (*Trumpet*), B. Dahlman (*Piano*), S. Brown (*Piano*), A. Reiff (*Voice*), S. Stang-McCusker (*Flute*), R. Anstine Smith (*Harp*), L. Ferguson (*Clarinet*), N. Snider (*Cello*), A. Mikolajewski (*Accompanist*), M. Scarlett (*Voice*), G. Corella (*Tuba*), D. Jones (*Clarinet*), R. Ocampo (*Voice*), D. Sciannella (*Trombone*), E. Drennen (*Jazz Violin*), D. Lonkevich (*Flute*), P. Gajewski (*Orchestra*), P. Bricker (*Jazz Voice*)
Assistant Professorial Lecturer S. Hilmy (*Electronic Studio*)
Lecturers J. Potter (*Mallet Percussion*), T. Williams (*Electric Bass*)

Bachelor of Arts with a major in music—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Mus 1, 2, 5, 9, 61 (or equivalent). Students must achieve grades of *C* or better in Mus 1 and 61 to declare the music major.
3. The language option listed under the General Curriculum Requirements of Columbian College.
4. Required courses in the major—Mus 105, 106, 126, 127, 139, 198; 4 credits of private applied music courses; 2 credits of music ensemble courses. In addition, 12 credits of music electives are required, at least 3 of which must be from a course numbered 162

and above. The distribution of these electives is as follows: history and literature (Mus 109, 110, 121, 122, 125, 175), 3 credits; theory and composition (Mus 70, 134, 135, 137, 161, 162, 174, 184), 3 credits; free electives in music, 6 credits. Because of the various options available in the B.A. program in music, students should consult with music faculty advisors at the earliest opportunity. All majors are expected to attend departmental lectures, master classes, and concerts, as appropriate.

5. Music majors are required to complete an approved independent project in their senior year, concurrently with registration in Mus 198. This project consists of a total of 2 to 6 credits, accumulated through registration for Mus 199 or any 100-level applied music course.

Special Honors in Music—To receive Special Honors in music, a student must meet the requirements stated under University Regulations and maintain a 3.5 grade-point average in music courses and at least a 3.0 average overall. The student must apply by the end of the junior year and complete the required senior independent project for at least 3 credits.

Minor in music—21 credit hours of music courses, consisting of Mus 1, 2, 5, 61, and 6 credits chosen from Mus 105, 106, 126, or 127; 3 credits of applied music study or ensemble, and 3 credits of music electives. All minors are expected to attend departmental lectures, master classes, and concerts, as appropriate.

Minor in jazz studies—23 credit hours of music courses, consisting of Mus 1, 2, 8, 10, 61, 70, 161; 4 hours of jazz performance techniques (Mus 59–60 or 159–60); and 2 hours of ensemble participation (Mus 52 or 55). All minors are expected to attend departmental lectures, master classes, and concerts, as appropriate.

MUSIC THEORY, COMPOSITION, HISTORY, AND LITERATURE

1 **Elements of Music Theory** (3) Boyce
Notation, scales, keys, intervals, terms, rhythms, and chord structure and progression. Introduction to music literature, with emphasis on rudimentary aural analysis. (Fall and spring)

2 **Comprehensive Musicianship I** (2) Boyce
Aural and keyboard skills development through dictation, sight singing, and performance and improvisation at the keyboard. Prerequisite: Mus 1, 61. (Fall and spring)

3 **Music in the Western World** (3) Krash and Staff
Introductory history of musical styles, related to listening; study of music materials and media. Not open to music majors. (Fall and spring)

4 **Topics in Music** (3) Staff
A rotating set of classes; topics may include: American music, a composer, the opera, and musical life in Washington, D.C. (Spring)

5 **Harmony** (3) Boyce
Study of tonal harmonic practice from Baroque, Classical, Romantic, and 20th-century repertoires. Concurrent registration in the weekly keyboard lab is required. Prerequisite: Mus 2. (Spring)

7 **Music of the World** (3) Ahlquist
Introduction to music in culture through comparative study of music from a variety of cultures worldwide. (Fall)

8 **History of Jazz** (3) Lornell
Introduction to the styles, composers, and performers of jazz music from its origins to the present. (Spring)

9 **Comprehensive Musicianship II** (2) Boyce
Aural and keyboard skills development through dictation, sight singing, and performance and improvisation at the keyboard. Prerequisite: Mus 5.

10 **Comprehensive Musicianship for Jazz** (2) Levy
Aural and keyboard skills development through dictation, sight singing, and performance and improvisation at the keyboard, with emphasis given to skills associated with jazz performance. Prerequisite: Mus 2. (Fall)

70 **Introduction to Jazz Harmony** (3) Fraize
Analysis and composition of tunes in jazz/pop styles. Study of rhythmic characteristics, voice-leading, and chord/scale relationships within a jazz context. Prerequisite: Mus 2. (Spring)

105 **Introduction to Ethnomusicology** (3) Ahlquist, Lornell
Models of understanding music as a cultural endeavor. Application and critique of models in the design and execution of student independent field research. Prerequisite: Mus 1 or permission of instructor. (Spring)

106 **Music History III: 20th-Century Art Traditions** (3) Ahlquist
Western musical traditions and styles since Romanticism and approaches to music as art in contemporary society. Prerequisite: Mus 1.

109 **Orchestra Literature** (3) Guenther
History and styles of orchestra literature, analysis of representative works. Prerequisite: Mus 5 or permission of instructor.

110 **Chamber Music Literature** (3) Youens
History and styles of chamber music literature, analysis of representative works. Prerequisite: Mus 5 or permission of instructor.

121 **Opera** (3) Youens
History and styles of opera, analysis of representative works. Prerequisite: Mus 5 or equivalent.

122 **Music in the United States** (3) Ahlquist
History of music and musical life in the United States, emphasizing relationships among traditions of diverse origin. Prerequisite: Mus 1 or permission of instructor.

125 **Keyboard Music Literature** (3) Staff
History and styles of keyboard literature from the 16th century to the present. Prerequisite: Mus 5 or equivalent.

126 **Music History I: Antiquity through Early Baroque** (3) Youens
The development of Western European music from its earliest traceable roots to the end of the early, experimental Baroque period. Prerequisite: Mus 2 and sophomore standing.

127 **Music History II: The Tonal Era** (3) Ahlquist
Styles, structures, social foundations and aesthetic change in European music of the late 17th through the late 19th centuries. Prerequisite: Mus 5.

134 **Composition** (3) Boyce
Introduction to 21st-century compositional practice; concepts of post-tonal analysis; emphasis on style studies and original student works. May be repeated for credit. Prerequisite: Mus 5.

135 **Counterpoint** (3) Staff
Study and practice of 16th-century contrapuntal techniques.

137 **Orchestration** (3) Staff
Instrumental scoring. Prerequisite: Mus 5.

139 **Form and Analysis** (3) Guenther
Analysis of musical forms in representative musical literature. Prerequisite: Mus 5 or equivalent. (Fall)

151 **Conducting** (3) Fritz
Technique of conducting, score reading, rehearsal procedures, analysis, and interpretation of selected musical literature; practice in conducting. Prerequisite: Mus 5. (Fall, even years)

161–62 **Electronic and Computer Music** (3–3) Hilmy
Fundamental electronic and computer music concepts. Analog and digital sound synthesis techniques and theory, MIDI, studio recording techniques, signal processing, properties of sound, acoustics and psycho-acoustics, history and aesthetics. Laboratory fee: $50 per semester.

173 **Pedagogy** (3) Staff
Principles, materials, and methods of teaching in selected areas. Prerequisite: permission of instructor.

174 **Topics in Music Theory and Composition** (3) Staff
A seminar on variable topics in the discipline of music theory, analysis, and composition. Topics may include analysis of post-tonal music, advanced jazz arranging, analysis of 14th-century vocal music, developments in extended instrumental techniques since 1950. Prerequisites depend on the topic; consult the department.

175 **Topics in Music History and Literature** (3) Staff
A seminar on variable topics in music history and literature in all traditions and styles. Topics may include German musical Romanticism, introduction to

critical musicology, the music of Josquin des Prez, and vernacular music in Washington, D.C. Prerequisites depend on the topic; consult the department.

184 **Advanced Composition** (3) Boyce
Private instruction in composition in tutorial format. Prerequisite: Mus 134.

198 **Senior Seminar** (1) Staff
Restricted to music majors in their final spring semester. Presentations of required senior projects in process; readings and discussion to place the projects in a broader musical and intellectual context. Corequisite: Mus 199.

199 **Independent Research** (1 to 4) Staff
Under the guidance of an assigned instructor. May be repeated for credit. Majors in their senior year take Mus 198 as a corequisite.

APPLIED MUSIC

Applied music courses are offered both fall and spring, and may be repeated for credit. For courses numbered 11 through 50 and 57 through 60, students may not register in the same semester for both the 1- and 2-credit course in the same instrument or in voice. Mus 51, 52, 53, 54, 55, 56, and 153 do not include individual lessons and do not require a supplementary fee. Mus 61–62, 63, and 64, involving group study of beginning piano, voice, and percussion, likewise do not require a supplementary fee. All other applied music courses include individual lessons and require a supplementary fee, as follows:

1. One-credit-hour courses: individual lessons of one-half hour a week, supplementary fee, $125.
2. Two- or three-credit-hour courses: individual lessons of one hour a week, supplementary fee, $250.

Supplementary fees for applied music courses are nonrefundable after the first two weeks of the fall and spring semesters. Consult the Music Department for details.

The supplementary fee is waived during the fall and spring semesters for full-time music majors and minors and for Presidential Arts Scholars in Music.

Departmental prerequisite: For Mus 11–12, Mus 61 or demonstration of adequate preparation. For Mus 15–16, level 2 piano proficiency or permission of instructor.

Required practice: a minimum of three hours a week for 1-credit courses and six hours a week for 2-credit courses.

11–12 **Piano** (1–2) Staff
13–14 **Voice** (1–2) Staff
15–16 **Pipe Organ** (1–2) E. Guenther
17–18 **Violin** (1–2) Parnas, Findley, Steiner
19–20 **Classical Guitar** (1–2) Waters, Albertson, Sislen
21–22 **Viola** (1–2) Parnas, Findley
23–24 **Cello** (1–2) Barnet, Snider
25–26 **Bass** (1–2) Staff
27–28 **Flute** (1–2) Stang-McCusker, Lonkevich
29–30 **Recorder** (1–2) Gilliam
31–32 **Oboe** (1–2) Staff
33–34 **Clarinet** (1–2) Ferguson, Jones
35–36 **Saxophone** (1–2) Fraize
37–38 **Bassoon** (1–2) Staff
39–40 **French Horn** (1–2) Fearing
41–42 **Trumpet** (1–2) Birch
43–44 **Trombone** (1–2) Sciannella
45–46 **Percussion** (1–2) Edgar, Connell, Potter
47–48 **Harp** (1–2) Seidman, Smith
49–50 **Tuba** (1–2) Corella

51 **University Symphony Orchestra** (1) Gajewski
Preparation and performance of orchestral literature. Prerequisite: audition before director.

52 **Instrumental Ensemble** (1) Staff
Chamber ensemble groups approved by audition. See the *Schedule of Classes* for complete listing: Section numbers are .10 flute choir, .11 guitar ensemble, .12 percussion ensemble, .13 jazz combo, .14 keyboard ensemble, .15 string ensemble, .16 woodwind ensemble, .17 brass ensemble, .18 Baroque ensemble, .19 Latin band, .20 blues revue.

53 **University Singers** (1) Mehaffey
Preparation and performance of choral literature. Prerequisite: audition before director.

54 **Chamber Choir** (1) Mehaffey
Preparation and performance of chamber vocal literature. Prerequisite: audition before director.

55 **Jazz Band** (1) Levy
Preparation and performance of classic and contemporary "big band" literature. Prerequisite: audition before director.

56 **University Band** (1) Fritz, Birch
Section .10 is University Symphonic Band; Section .11 is University Wind Ensemble.

57–58 **Harpsichord** (1–2) Garst

59–60 **Jazz Performance Techniques** (1–2) Staff
See the *Schedule of Classes* for complete listing: Section numbers are .10 piano, .11 bass, .12 percussion, .13 guitar, .14 brass, .15 woodwind.

61–62 **Class Piano for Beginners** (1–1) Staff
Study of the rudiments of musical notation and piano playing in a small classroom setting; designed to take students who do not read music to a beginner's level of proficiency. Prerequisite to Mus 62: Mus 61 or permission of the instructor. Open to all undergraduates.

63 **Class Voice for Beginners** (1) Staff
Study of the rudiments of musical notation and basic vocal technique in a small classroom setting. Open to all undergraduates.

64 **Class Percussion for Beginners** (1) Edgar
Basic musicianship and percussion performance skills on snare drum. Reading of standard musical notation and technical development of grips.

81–82 **Lute** (1–2) Albertson

Departmental prerequisite: for applied music courses 111–160, approval of instructor and appropriate area coordinator.

Required practice: a minimum of four hours a week for 1-credit courses and eight hours a week for 2-credit courses.

111–12 **Piano** (1–2) Staff

113–14 **Voice** (1–2) Staff

115–16 **Pipe Organ** (1–2) E. Guenther

117–18 **Orchestral Instrument** (1–2) Staff

119–20 **Classical Guitar** (1–2) Albertson, Sislen, Waters

153 **Vocal Theater Workshop** (1) Von Villas, Conlon
A performance-oriented program. In the fall semester the stress is on development of body awareness for the stage, acting improvisations, and character development. Scenes chosen from the opera, operetta, and musical theater repertoire. In the spring semester, musical coaching, use of makeup, and audition preparation is included.

157–158 **Harpsichord** (1–2) Garst

159–60 **Jazz Performance Techniques** (1–2) Staff

185 **Advanced Performance Study** (3) Staff
Private study in vocal or instrumental performance. Public performance and a minimum of 12 hours of practice per week are required. Prerequisite: audition before a faculty committee.

NAVAL SCIENCE

Professor P.J. Healey (*Chair*)
Associate Professor F. Stein
Assistant Professors K.M. Butler, S.W. Hodgson, L.L. Lazzari, M.E. Chapman, B.W. Ward, E. Sager

Naval Reserve Officers Training Corps Program

The Naval Reserve Officers Training Corps (NROTC) offers young men and women the opportunity to qualify for a full scholarship and a commission in the Navy or Marine

Corps. NROTC midshipmen are required to complete the naval science courses and attend weekly professional seminars. During the summer, NROTC midshipmen participate in active duty at sea or shore-based training cruises for approximately four weeks. Upon receiving the baccalaureate and completing the NROTC program, qualified midshipmen are commissioned as ensigns in the Naval Reserve or second lieutenants in the Marine Corps Reserve. Commissioned naval officers go on to training in various warfare specialties and serve as surface or submarine officers, naval aviators, or SEALs. Marine Corps officers attend basic school in Quantico, Virginia, and serve in fields such as infantry, artillery, and aviation. Staff positions (intelligence, law, medicine) are not normally offered through NROTC. Students may join the NROTC through any one of the following programs.

Four-Year Scholarship Program—Students enter the NROTC Four-Year Scholarship Program through national competition and are appointed midshipmen in the Naval Reserve. While enrolled, a four-year-scholarship student receives government-provided tuition, fees, $350 per semester for books, uniforms, and an allowance of up to $400 per month. Upon graduation, students are commissioned with a four-year active duty service obligation. Scholarship Program students must include in their degree program courses in English, calculus, computer science, physics, national security policy, and naval science and participate in three summer training periods of approximately four weeks each.

Two-Year Scholarship Program—Selection for this program is made through national competition, based on the student's academic record, physical qualifications, and an interview. Application should be made by the middle of the fall semester of the student's sophomore year. Selected applicants attend six weeks of instruction at the Naval Science Institute (NSI) at Newport, Rhode Island, during the summer before their third academic year. At NSI, students take courses in naval science, physical fitness, and drill, similar to those required of four-year NROTC students during their freshman and sophomore years. Successful completion of the NSI program qualifies the two-year applicants for appointment as midshipmen in the Naval Reserve and enrollment in the NROTC Scholarship Program. Upon acceptance of this appointment, students receive all the benefits and assume all the obligations of midshipmen in the Four-Year Scholarship Program.

Entering freshmen and transfer students who are awarded NROTC scholarships and plan to live on campus may also be eligible for GW Residence Hall Awards from the University. NROTC scholars with prior experience in the Navy are eligible for awards covering the nominal charges for on-campus housing and meals. NROTC scholars who are new to the Navy and are majoring in mathematics, chemistry, physics, or a program in the School of Engineering and Applied Science may receive up to $4,000 to be applied toward the costs of on-campus housing and meals. Further information on these awards is available from the University Office of Admissions.

Four-Year College Program—Students are enrolled in a non-scholarship Four-Year College Program upon acceptance by the Department of Naval Science. Uniforms are provided, and during their junior and senior years, students receive up to $400 per month. Students must include in their degree program courses in college algebra, science, and naval science and must attend the four-week at-sea training period between junior and senior year. Upon commissioning, College Program students serve a minimum of three years' active duty. Midshipmen who complete one term as College Program students, have a satisfactory academic record, and are physically qualified may compete for a scholarship awarded by the Chief of Naval Education and Training. If awarded, the scholarship will be for the remainder of the student's undergraduate enrollment, up to a maximum of three and a half years; service requirements and benefits are the same as for the scholarship programs.

Two-Year College Program—Application should be made by the middle of the fall semester of the student's second year. Selections are made through the Chief of Naval Education and Training, based on the student's academic record, physical qualifications, and an interview. Those students selected will attend the NSI and upon successful completion may enroll in the program. The benefits and obligations are the same as for the Four-Year College Program.

Requirements for all candidates—Qualifications for acceptable candidates for the Scholarship Program or the College Program include U.S. citizenship, fulfillment of physical requirements, and willingness to participate in required summer training periods and to accept a commission in the Naval Reserve or Marine Corps Reserve when offered.

Enrollment in NROTC is not a requirement for taking naval science courses. Any student enrolled at George Washington University may take naval science courses with the approval of the Professor of Naval Science.

Degree Credit for Naval Science Courses

Columbian College of Arts and Sciences—NSc 126, 160, and 180 are acceptable as electives. Up to 12 credit hours (for NSc 52, 150, 175, and 176) may be accepted as professional electives in Columbian College.

School of Engineering and Applied Science—NSc 126 and 160 may be used for social science credit. Technical elective credit is acceptable as follows: for majors in civil engineering and mechanical engineering—NSc 52, 150, 175; for majors in electrical engineering—NSc 52 and 150; for majors in systems engineering—NSc 150, 151, 175, and 176.

School of Business—All NSc courses are applicable to the B.B.A. and B.Accy. degree programs; check with the director of undergraduate advising and student services in School of Business.

Elliott School of International Affairs—NSc 126, 160, 175, 176, and 180 may be used as elective credit in all undergraduate programs.

51 **Introduction to Naval Science** (3)
A general introduction to the naval profession and to concepts of sea power. The mission, organization, and warfare components of the U.S. Navy and Marine Corps. Overview of officer and enlisted ranks and rates, training and education, and career patterns. Naval courtesy and customs, military justice, leadership, and nomenclature. Professional competencies required to become a naval officer.

52 **Naval Ships Systems I (Engineering)** (3)
A detailed study of ship characteristics and types, including ship design and control, propulsion, hydrodynamic forces, stability, compartmentation, and electrical and auxiliary systems. Included are basic concepts of the theory and design of steam, gas turbine, and nuclear propulsion.

125 **Naval Ships Systems II (Weapons)** (3)
Theory and employment of weapons systems, including the processes of detection, evaluation, threat analysis, weapon selection, delivery, guidance, and explosives. Fire control systems and major weapons types, including capabilities and limitations. Physical aspects of radar and underwater sound. Facets of command, control, and communications as means of weapons system integration.

126 **Sea Power and Maritime Affairs** (3)
A survey of the U.S. naval history. Naval aspects of U.S. conflicts from the American Revolution to the global war on terror. The influence of technological innovation, domestic politics, and foreign policy on the development and execution of naval doctrine and tactics.

150 **Navigation and Naval Operations I** (3)
Students develop practical skills in naval piloting procedures. Charts, visual and electronic aids, and theory and operation of magnetic and gyro compasses; inland and international rules of the nautical road. A broad overview of the celestial coordinate system, including spherical trigonometry and how celestial information can be applied to navigation at sea. Basic principles of environmental factors affecting naval operations.

151 **Navigation and Naval Operations II** (3)
Relative motion vector analysis theory, formation tactics, and ship employment; practical skills in relative motion problems. Controllable and noncontrollable forces in shiphandling, ship behavior, and maneuvering characteristics; various methods of visual communication, including flaghoist, flashing light, and semaphore.

160 **Evolution of Warfare** (3)
This course traces the development of warfare, from earliest recorded history to the present, with focus on the impact of major military theorists, strategists, tacticians, and technological developments. The student acquires a basic sense of strategy and develops an understanding of military alternatives and the impact of historical precedent on military thought and actions.

175 **Leadership and Management** (3)
Organizational behavior, management, and leadership principles in the context of naval organization. The management functions of planning, organizing, and controlling; individual and group behavior in organizations; motivation and leadership. Experiential exercises, case studies, and laboratory discussions. Decision making, communication, responsibility, authority, and accountability.

176 **Leadership and Ethics** (3)
The interaction of leadership, organizational behavior, and human resource management. Subordinate interviewing and counseling, performance appraisal, military and civilian law, and managerial ethics and values. This capstone course integrates professional competencies to develop understanding of the issues faced by leaders, managers, and naval officers.

180 **Amphibious Warfare** (3)
A historical survey of the development of amphibious doctrine and the conduct of amphibious operations. The evolution of amphibious warfare in the 20th century, especially during World War II. Present-day potential and limitations on amphibious operations, including the concept of rapid deployment force.

ORGANIZATIONAL SCIENCES

Students in Columbian College of Arts and Sciences may earn a minor in organizational sciences, which is also available as a secondary field to undergraduates in other schools of the University. The program emphasizes linkages among individuals, organizations, and the larger environment by examining organizational theory and practice.

Minor in organizational sciences—Required: 18 credit hours, including OrSc 109, 116, 143; Psyc 144; plus two courses selected from Comm 170, 171, 173; Psyc 119, 193.

Minor in organizational communication—See Communication.

109 **Strategic Systems Thinking in Organizations** (3)
The evolution of organizations in terms of social context and the present-day systems environment. Emerging roles of leadership, communication, and employer–employee relationships. Organizational models are used to develop strategic thinking about career and life roles.

116 **Leading Change** (3)
An in-depth introduction to and analysis of concepts and techniques of leadership, including motivation, goal alignment, incentives, teamwork, and communication. Conceptual and empirical background of the management of change.

143 **Leadership and Performance** (3)
Leadership from an organization system perspective. Theory, research, and applications pertaining to how leaders can reduce uncertainty through appropriate adaptive change.

PEACE STUDIES

Committee on Peace Studies
P. Caws, P. Churchill, P.J. Hotez, T.L. Hufford, S. Livingston, P. Palmer, J. Post, M. Price, H. Yeide

Students in Columbian College of Arts and Sciences may earn a minor in peace studies by taking 18 credit hours that include PStd 10 and 190 plus at least one course from each of the groups listed below. Undergraduates in other schools of the University may take peace studies as a secondary field.

Peace as a Human Value—Phil 133; Rel 120, 121; WStu 125.

Peace and National and International Systems—Econ 136, 181; Geog 120, 133; Hist 126, 129, 157, 184; PSc 140, 142, 144, 149.

Peace and Interpersonal Relations—EMda 175, 188; Psyc 119, 125, 156; Soc 184.

With approval of the advisor, Selected Topics courses and 700 Series courses in related subjects may be counted toward the minor. An internship in a relevant agency (through SLP 152) may also count for 3 hours of credit, with advisor's prior approval.

10 **Introduction to Peace Studies and Conflict Resolution** (3) Staff
Cross-disciplinary exploration of war and its causes; approaches to peace as a negative concept (absence of war) and as a positive concept (basis for long-range, harmonious relations in personal, social, and international life); exploration of nonviolent responses to conflict, violence, and war. (Fall)

190 **Peace Studies Project** (3) Staff
Individual project to integrate previous academic experience related to peace studies and a groundwork for possible future engagement with peace concerns through graduate work, career choice, or volunteer activities. To be taken in the

semester when requirements for the minor are completed. Permission of instructor required.

PHILOSOPHY

University Professors P.J. Caws, K.F. Schaffner
Professors W.B. Griffith (*Chair*), R.P. Churchill, D. DeGrazia
Associate Professor G. Weiss
Assistant Professors I. Farber, M. Friend, E.J. Saidel, J.C. Brand-Ballard
Adjunct Associate Professor N. Mikhalevsky
Assistant Professorial Lecturer R. Carr

Two options are offered for the major in philosophy, both designed to give a broad background in philosophy but with somewhat different emphases. The first option reflects the traditional structure of the discipline and its subfields; it is especially recommended for those considering the possibility of graduate study in philosophy. The second option is designed for those primarily interested in philosophy in its relationship to public affairs.

Bachelor of Arts with a major in philosophy (traditional option)—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Phil 51; Phil 45 recommended.
3. Required courses in related areas—3 hours of non-Western religious philosophy selected from Rel 152, 157, 158, 160, 161, 164.
4. Required courses in the major—a minimum of 30 credit hours, including as foundational courses Phil 111, 112, 131; one course selected from Group A (value theory)—Phil 125, 132, 133, 142, 162; one course from Group B (epistemological)—Phil 121, 151, 152, 153; one course from Group C (later history)—Phil 113, 172, 192, 193; the proseminar—Phil 198; plus three electives chosen from 100-, 200-, or 700-level courses, selected in consultation with a departmental advisor.

Phil 121, 151, 153, 192, and 193 are recommended for students considering graduate-level study of philosophy; French or German language study is recommended as well.

Bachelor of Arts with a major in philosophy (public affairs option)—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Phil 51; Phil 45 recommended
3. Required courses in related areas—6 credit hours selected from Hist 39–40, 71–72; PSc 105, 106, 107, 110, 114, 115; Econ 11–12, 101–2, 104.
4. Required courses in the major—a minimum of 30 credit hours, including as foundational courses Phil 111, 112, 131, 132; two courses selected from Group A (value theory)—Phil 125, 133, 135, 142, 162; one course from Group B (epistemological)—Phil 121, 151, 152, 153; the proseminar—Phil 198; two electives selected in consultation with the advisor from 100-, 200-, or 700-level courses.

Special Honors—In addition to the general requirements stated under University Regulations, in order to be considered for graduation with Special Honors, a student must (1) have attained a 3.7 grade-point average in the major and at least a 3.25 average overall; (2) submit an honors paper prepared under the supervision of a faculty advisor in the department. Only if a committee of three faculty members in the department approves the honors paper will Special Honors be recommended.

Minor in philosophy—Required: a minimum of 18 credit hours of philosophy courses, including two courses chosen from Phil 51, 111, 112, 113, 172; one course from Phil 125, 131, 132, 133, 135, 142, 162; and one course from Phil 121, 151, 152, 153.

Minor in applied ethics—Required: 18 credit hours of philosophy courses, including Phil 51, 131, and 132, plus three courses selected from Phil 133, 135, 142, 755, or with permission of the instructor, seniors may select from Phil 230, 231, 238, 242, 250, 262, which are listed in the Graduate Programs Bulletin.

45 **Introduction to Logic** (3) Friend, Saidel, and Staff
Introduction to informal logic, scientific argument, and formal logic. The informal logic component focuses on fallacies of reasoning and practical applications of logic. The formal logic component focuses on translation from English into propositional logic, truth tables, and proofs in propositional logic. (Fall, spring, and summer)

51 **Introduction to Philosophy** (3) Griffith, Saidel, and Staff
Readings from major philosophers and study of their positions on the most basic questions of human life. Topics include such issues as: What is justice? What is knowledge? What is reality? Does God exist? What is the mind? Do humans have free will? (Fall and spring)

62 **Philosophy and Film** (3) Caws
Philosophical problems and theories of perception, meaning, personal identity, and moral agency and their illustration in the context of cinema. Cinema and its derivatives (TV, video) as prime routes to experience of the natural and social worlds in an age of communication. Readings in classical and contemporary philosophy and in film theory; screening of a series of films. (Spring)

111 **History of Ancient Philosophy** (3) Staff
History of Western philosophy from the Pre-Socratics to the Stoics (6th century BCE to 1st century CE). Major emphasis on the writings of Plato and Aristotle. Among themes to be covered: knowledge and reality, political and moral philosophy. (Fall and spring)

112 **History of Modern Philosophy** (3) Churchill
History of Western philosophy of the 16th through 18th centuries; Continental Rationalism and British Empiricism from the scientific revolution through the Enlightenment; major emphasis on Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. Prerequisite: Phil 51 or equivalent. (Spring)

113 **19th-Century Philosophy** (3) Carr
European philosophy of the 19th century, with major emphasis on Kant, Hegel, Schopenhauer, Kierkegaard, and Nietzsche. Prerequisite: Phil 51 or equivalent. (Fall)

121 **Symbolic Logic** (3) Friend and Staff
Analysis and assessment of deductive arguments, using propositional, predicate, and other logics; philosophical basis and implications of logical analysis; metatheory of logic; modal and non-standard logics. Prerequisite: Phil 45 or permission of instructor. (Fall and spring)

125 **Philosophy of Race and Gender** (3) Weiss and Staff
A theoretical examination of the bodily, social, discursive, and political effects of patriarchy, racism, and classism. (Fall and spring)

131 **Ethics: Theory and Applications** (3) Griffith, DeGrazia, Churchill
Examination of leading ethical theories, e.g., utilitarianism, deontology, virtue theory, as well as anti-theory and methodology in ethics. Applications to contemporary problems. (Fall and spring)

132 **Social and Political Philosophy** (3) Griffith, Brand-Ballard
Philosophical theories about how economic, political, legal, and cultural institutions should be arranged. Topics include the meaning and significance of liberty, the legitimate functions of government, the nature of rights, the moral significance of social inequality, and the meaning of democracy. (Fall and spring)

133 **Philosophy and Nonviolence** (3) Churchill
Violence and nonviolence in the personal and social struggle for meaningful, just, and peaceful existence; philosophical foundations of pacifism and nonviolent resistance in the thought of Tolstoy, Gandhi, King, and others; philosophical inquiry into war, terrorism, genocide and ethnic conflict, as well as human rights, humanitarian intervention, and just war theory. (Fall)

135 **Ethics in Business and the Professions** (3) Griffith and Staff
Basic concepts and theories of ethics for analysis of moral issues arising in business and in professional practice. (Fall and spring)

142 **Philosophy of Law** (3) Brand-Ballard
Systematic examination of fundamental concepts of law and jurisprudence; special emphasis on the relationship between law and morality. (Fall)

151 **Philosophy and Science** (3) Farber
Analysis of the structure and meaning of science, including scientific progress and theory change, objectivity in science, the drive for a unified science, and ways science relates to everyday understandings of the world. Attention given to various sciences, including physics, biology, and neuroscience. Prerequisite: Phil 51 or two semesters of college-level science. (Fall)

152 **Theory of Knowledge** (3) DeGrazia, Farber
Inquiry into the basis and structure of knowledge, the problems of skepticism and justification, the relations between subjectivity and objectivity, and the con-

tributions of reason, sense, experience, and language. Prerequisite: Phil 51 or equivalent; Phil 112 also recommended. (Spring)

153 **Mind, Brain, and Artificial Intelligence** (3) Farber
Investigation of the nature of mind from a variety of perspectives, including neuroscience, cognitive psychology, and artificial intelligence, as well as traditional philosophy of mind. Possible additional topics include consciousness, mental disorders, animal minds, and the nature and meaning of dreams. (Spring)

161 **Philosophy and Literature** (3) Weiss
Critical investigation of the sociopolitical commitments that inform the practices of reading and writing as discussed by Sartre, Barthes, Foucault, Baudrillard, and others. Focus on the development of existentialist themes, including authenticity, freedom, temporality, and death in the work of Kafka, Tolstoy, Mann, Woolf, Sexton, and Stein. (Spring)

162 **Aesthetics** (3) Weiss, Mikhalevsky
The problem of artistic representation and the nature of aesthetic experience as related to the creation, appreciation, and criticism of art. Special emphasis on nonrepresentational works of art and their interpretation. Prerequisite: Phil 51 or 111 or 112 or 113. (Fall)

172 **American Philosophy** (3) Caws, Farber, Carr
A survey of American philosophical thought, focusing on the late 19th through mid-20th centuries. Covers American Pragmatism (Peirce, James, Dewey) in depth; other authors may include Thoreau, Emerson, Royce, Santayana, Mead, Quine and Rorty. (Spring)

192 **Analytic Philosophy** (3) DeGrazia, Saidel
The dominant movements of 20th-century Anglo-American philosophy, including logical positivism, British ordinary language philosophy, and neopragmatism, as represented by Russell, G.E. Moore, Wittgenstein, Ayer, Quine, Kripke *et al.* Prerequisite: One other 100-level philosophy course. (Fall)

193 **Phenomenology and Existentialism** (3) Weiss, Caws
An intensive exploration of the ontological and existential philosophies of Kierkegaard, Bergson, Husserl, Heidegger, Sartre, Merleau-Ponty, de Beauvoir, and Camus. Prerequisite: One other 100-level philosophy course. (Spring)

198 **Proseminar** (3) Staff
Variable topics; preparation and presentation of a major research paper. Open only to philosophy majors, in either the junior or senior year as approved by major advisor. (Fall and spring)

199 **Readings and Research** (3) Staff
(Fall and spring)

PHYSICS

Professors D.R. Lehman, B.L. Berman, L.C. Maximon (*Research*), W.C. Parke, R.A. Arndt (*Research*), W.J. Briscoe, C. Bennhold (*Chair*), E.F. Skelton
Associate Professors N.K. Khatcheressian, E.P. Harper, J.R. Peverley, H. Haberzettl, K.S. Dhuga, M.E. Reeves, G. Feldman, I. Strakovsky (*Research*), R.L. Workman (*Research*), A. Eskandarian, F.X. Lee, J. Hanchar
Assistant Professors C. Zeng, S. Strauch (*Research*), J.J. Balbach, W. Peng
Professorial Lecturer B. Ratnam
Associate Professorial Lecturers J.T. Broach, M.F. Corcoran

Bachelor of Arts with a major in physics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Phys 21, 22, 23; Math 31, 32, 33.
3. Required courses in related areas—Chem 11 or BiSc 13; one approved 100-level math course.
4. Required courses in the major—Phys 151 or 152, 161, 164, 165, 167, and two approved 100-level physics electives (Phys 195 is recommended).

Bachelor of Science with a major in physics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Phys 21, 22, 23; Math 31, 32, 33.

3. Required courses in related areas—Chem 11 or BiSc 13; one approved course in computer programming and two approved 100-level math courses..
4. Required courses in the major—Phys 151 or 152, 161, 164, 165, 167, 195, and two approved 100-level physics electives.

Bachelor of Science with a major in biophysics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Phys 21, 22, 23; Math 31, 32, 33.
3. Required courses in related areas—Chem 11–12, 151–52; BiSc 13, 14, 109, and either 103 or another approved 100-level BiSc course; Stat 127; one approved computer programming course.
4. Required courses in the major—Phys 127–28, 151 or 152, 161, 164, 165, 195.

Bachelor of Arts with a major in physics and Bachelor of Science in any SEAS undergraduate field—Five-year programs leading to the two degrees are available. Check with the Department of Physics or with the School of Engineering and Applied Science.

Special Honors—To graduate with Special Honors, a student must meet the eligibility requirements stated under the University Regulations and submit for departmental approval an honors thesis based on a two-semester research project. In addition, the student must have a cumulative grade-point average of at least 3.5 in physics courses and 3.0 overall.

Minor in physics—Required: Phys 21, 22, 23, plus two approved 100-level physics courses.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

ASTRONOMY

1 **Introduction to Astronomy I** (3) Maximon, Dhuga, Parke, Skelton, Briscoe
Primarily for non-science majors. Classical through modern astronomy, with introduction to basic principles underlying astronomical systems and observations. Lectures cover electromagnetic radiation, optical instruments, and the solar system. Laboratory (2 hours). Prerequisite: high school algebra. Laboratory fee, $55. (Fall and spring)

2 **Introduction to Astronomy II** (3) Maximon, Dhuga, Parke, Skelton, Briscoe
Primarily for non-science majors. Stellar and extragalactic astronomy, including introduction to quantum aspects of electromagnetic radiation and atomic physics, stellar spectra, and stellar evolution. Laboratory (2 hours). Prerequisite: Astr 1. Laboratory fee, $55. (Spring)

51 **Modern Cosmology** (3) Parke
A non-mathematical treatment of cosmology, describing the origin and evolution of the universe. Topics include the nature of quasars, pulsars, stellar and galactic black holes, antimatter, gravitational lensing, dark matter, cosmic background radiation, the origin of the elements, big-bang theory, and the future of the universe. Prerequisite: Astr 2.

191 **Space Astrophysics** (3) Corcoran
Physical processes of celestial phenomena as determined from space-based instrumentation. While the entire electromagnetic spectrum is covered, the high-energy (X-ray and gamma ray) region is emphasized. Results from ground-based instrumentation (e.g., radio and optical) may be introduced. Prerequisite: Phys 22 or equivalent.

PHYSICS

1 **General Physics I** (4) Bennhold, Feldman, Balbach
Classical physics. Mechanics, including Newton's laws of motion, force, gravitation, equilibrium, work and energy, momentum, and rotational motion; periodic motion, waves, and sound; heat and thermodynamics. Prerequisite: high school trigonometry. Laboratory fee, $55. (Fall and spring)

2 **General Physics II** (4) Feldman, Bennhold, Balbach
Classical and modern physics. Electrostatics, electromagnetism, direct and alternating current circuits, and electromagnetic radiation; geometrical and phys-

ical optics; special relativity; quantum theory; atomic physics; nuclear physics; particle physics; astrophysics and cosmology. Prerequisite: Phys 1. Laboratory fee, $55. (Fall and spring)

7 **Music and Physics** (4) Berman
Primarily for non-science majors. A comparative study of music and physics, showing parallels in the history of the two fields and emphasizing those topics in physics related to the theory of music and the production of sound by musical instruments, particularly classical mechanics and wave motion. Prerequisite: high school algebra and geometry. Laboratory fee, $55.

8 **Origin and Evolution of Ideas in Physics** (4) Staff
Primarily for non-science majors. The evolution of ideas and their historical continuity in the search for basic physical theories. By presenting the world-views of great physicists of the past, the division of physics into many sub-disciplines is avoided and a humanistic approach is achieved. Prerequisite: high school algebra. Laboratory fee, $55.

21 **University Physics I** (4) Parke, Haberzettl, Lee
Classical mechanics using calculus. Newtonian mechanics: force, momentum, work and energy, mechanical equilibrium, linear, periodic and rotational motion. Gravitation and fields. Atoms, physical properties of matter. Energy transfer and waves, sound. Prerequisite: Math 31; corequisite: Math 32. Laboratory fee, $55. (Fall and spring)

22 **University Physics II** (4) Berman, Lee
Thermodynamics and classical electromagnetism using calculus. Equations of state, heat, and the laws of thermodynamics. Electrostatics, Gauss's law, capacitance. Electric resistance, electric current. Magnetism. Electrodynamics and electromagnetic induction. Maxwell's theory and electromagnetic radiation. Geometric and physical optics. Prerequisite: Phys 21 and Math 32. Laboratory fee, $55. (Fall and spring)

23 **University Physics III** (3) Reeves
Modern physics using calculus. Relativity. Wave–particle duality, quantum mechanics. The hydrogen atom, Pauli principle. Quantum statistics and radiation. Quantum theory of the condensed state, superconductivity. Nuclear physics. Applications to astrophysics and nucleosynthesis. General relativity. The big bang theory. Prerequisite: Phys 22; corequisite: Math 33. (Fall)

127–28 **Biophysics: Physics in the Life Sciences** (3–3) Parke, Zeng
Physical principles applied to biological systems, medicine, and instrumentation in medicine and biology. Applications include biological transducers, molecular biophysics, bioenergetics, radiation biology, ordering theory, neural networks, and protein structuring. Prerequisite: Phys 1 and 2 or equivalent.

151 **Intermediate Laboratory I: Techniques and Methods** (3) Peverley
Experiments in electromagnetism, classical and quantum mechanics, atomic and nuclear physics with emphasis on experimental methods. Laboratory fee, $55. (Fall)

152 **Intermediate Laboratory II: Instrumentation** (3) Peverley
Elementary electric and electronic analog and digital circuits. Topics include passive and active components in DC and AC circuits and operational amplifiers, with emphasis on measurement techniques. Laboratory fee, $55. (Spring)

161 **Mechanics** (3) Briscoe, Haberzettl, Reeves
Mechanics of mass points and rigid bodies. Newton's laws, conservation laws, Euler's equations, inertia tensor, small vibrations, and elements of Lagrange's and Hamilton's equations.

163 **Physical and Quantum Optics** (4) Peverley
Lecture (3 hours), laboratory (3 hours). Wave motion, electromagnetic aspects of light, dispersion of light in media, geometrical optics, polarization and optical properties of crystals, interference, diffraction, lasers, holography. Mathematical tools, including Fourier methods, developed as needed. The quantum description of light complements the classical description. Laboratory fee, $55.

164 **Thermodynamics** (3) Staff
Principles and application of thermodynamics to reversible and irreversible processes, with derivation from statistical postulates applied to the microscopic behavior of large systems near equilibrium.

165 **Electromagnetic Theory I** (3) Peverley
Electrostatics and magnetostatics, electric and magnetic fields in matter, scalar and vector potentials, electromagnetic induction. Maxwell's equations. The methods of vector and tensor calculus are developed as needed, as are the method of images, Fourier series, and some computational methods. (Fall)

166 **Electromagnetic Theory II** (3) Staff
Conservation laws, electromagnetic waves, radiation, relativistic formulation of electrodynamics and potential fields. (Spring)

167 **Principles of Quantum Physics** (3) Reeves, Zeng
Development of logical structure and experimental bases for modern quantum mechanics. Simple examples worked out to clarify the structure; primary emphasis on conceptual framework and its mathematical realization; careful consideration of the laboratory results to which the theory is a response.

170 **Solid-State Physics** (3) Peverley, Reeves, Zeng, Balbach
Structure of solids, lattices and lattice defects, deformation, vibrational and electronic contribution to specific heats, binding energies, electronic states in metals and semiconductors, magnetic properties of solids, superconductivity. Prerequisite: Phys 167 or permission of instructor.

175 **Nuclear Physics** (3) Berman, Briscoe
Introduction to application of quantum physics in the description of nuclei and their interactions. Properties of nuclei, nuclear models, nuclear forces, and nuclear reactions are considered. Specific topics include the deuteron, n-p scattering, the optical model, the shell model, the liquid-drop model, beta decay, fission, and fusion. Prerequisite: Phys 167 or permission of instructor.

181 **Computational Physics** (3) Reeves, Dhuga, Haberzettl, Eskandarian
Topics include celestial mechanics, chaotic systems, fluid dynamics, and other such complex systems that require a computational approach. Prerequisite: three semesters of undergraduate calculus and a complete sequence of calculus-based physics; working knowledge of C or FORTRAN. Laboratory fee, $55.

195 **Undergraduate Research** (3) Staff
Research on problems approved by the faculty. May be repeated once for credit. Laboratory fee, $55.

POLITICAL COMMUNICATION

See **Media and Public Affairs.**

POLITICAL SCIENCE

University Professor J.N. Rosenau
Professors B. Reich, J.M. Logsdon, H.R. Nau, M.A. East, J.B. Manheim, C. McClintock, L. Sigelman, M.J. Sodaro, S.L. Wolchik, H. Harding, D. Shambaugh, C.J. Deering (*Chair*), H.B. Feigenbaum, N.J. Brown, H.L. Wolman, F. Maltzman, M. Finnemore, J. Goldgeier
Associate Professors J.H. Lebovic, R.P. Stoker, A. Bowie, S.K. Sell, D.D. Avant, B. Dickson, P. Wahlbeck, L. Zeng, M.M. Mochizuki, S.J. Balla, S. Binder, S. Wiley, I. Creppell
Assistant Professors J.M. Smith, E.Z. Csergo, W.J. Winstead, E. Voeten, E.A. Posner, M.A. Schwartzberg, K.J. Morgan, A.E. Searight, C. Rector, S. Kelts, E.D. Lawrence, G.S. Lambright, H. Farrell

Bachelor of Arts with a major in political science—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite: PSc 1, 2, and 3 (or the equivalent). Six courses in the social sciences, other than political science, to include 6 hours of history or 6 hours of economics. Twelve credit hours of introductory foreign language and statistics are strongly recommended.
3. Required courses in the major: 30 credit hours of 100-level political science courses, including a distribution requirement that consists of 3 credit hours from each of the following groups: Group A (comparative politics)—PSc 130, 131, 134, 167, 170, 173, 177, 179, 180, 181, 183; Group B (American government and politics)—PSc 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 124, 128, 129; Group C (international politics, law, and organizations)—PSc 139, 140, 142, 144, 146, 149, 161, 168, 175, 176, 178, 180, 182,

184; Group D (methodology)—PSc 101, 104; Group E (political thought)—PSc 105, 106, 107, 108, 110.

Every major must complete a proseminar (which counts toward the 30-hour requirement) in the junior or senior year. A maximum of two of these may be included in a student's program; such courses do not satisfy the department's group distribution requirements. A 200-level course may be substituted for the proseminar requirement with the written permission of the instructor and the undergraduate coordinator.

Bachelor of Arts with a major in political science (public policy focus)—Requirements are the same as for the B.A. with a major in political science with the required 30 credit hours of 100-level courses in political science distributed as follows: PSc 104; 9 credit hours in policy-oriented courses to be selected from PSc 112, 117, 122, 124, 146; one policy-oriented proseminar; 3 additional credit hours from each of Groups A, B, C, and E; and 3 credit hours in a political science elective at the 100 level.

No more than 3 hours of service-learning or internship courses may be credited toward the major; these courses do not satisfy the distribution requirement.

Five-Year Bachelor's/Master's Dual Degree Programs—Three master's programs can be undertaken in combination with the Bachelor of Arts with a major in political science. Departmental majors should consult the undergraduate program advisor at the beginning of the junior year for the dual degree programs that lead to the Master of Arts in the field of legislative affairs and the Master of Public Policy (the M.P.P. is available only to majors in the public policy focus). For the dual degree program leading to the Master of Arts in the field of political science, students should consult the undergraduate program advisor as soon as possible in order to select courses appropriately; the program is available only to students who qualify for Special Honors.

Special Honors—Students may apply for graduation with Special Honors. To qualify, a student must fulfill the general requirements stated under University Regulations, have a GPA in the major of 3.5 or higher, and take PSc 192 in the semester preceding the final semester of study. Those with a GPA in the major of 3.8 and higher will then be recommended for Special Honors. Those with a GPA in the major between 3.5 and 3.7 must complete an independent research project in PSc 192 that has been approved as meriting Special Honors by two members of the Political Science faculty. Application for Special Honors must be in writing and received by the undergraduate coordinator by the third week of the semester preceding the final semester of study.

Minor in political science—Required: PSc 1, 2, and 3 (or the equivalent) plus 12 credit hours of 100-level political science courses, including a distribution requirement of one course each from Groups D and E. A minimum of 9 credit hours of other social science courses is also required.

With permission of the instructor and the undergraduate coordinator, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Departmental prerequisite: PSc 1 is prerequisite to Group A courses (comparative politics), PSc 2 is prerequisite to Group B courses (American government and politics), and PSc 3 is prerequisite to Group C courses (international politics, law, and organizations). Courses are defined by their group under item 3, above. Elliott School students substitute IAff 5 for PSc 3 as a prerequisite to Group C courses. Qualified juniors and seniors who are not political science majors and who wish to take 100-level PSc courses without having the appropriate prerequisites may do so only with the written permission of the instructor.

1 **Introduction to Comparative Politics** (3) Sodaro
Concepts and principles of comparative analysis, with an examination of politics and government in selected countries.

2 **Introduction to American Politics and Government** (3) Sigelman, Maltzman
Structure, powers, and processes of the American political system and the impact on public policy.

3 **Introduction to International Politics** (3) Goldgeier, Nau, Lebovic
Analysis of world politics, focusing on the role of nation–states and international organizations and on selected foreign policy issues.

11–12 **Introduction to Politics** (6–6) Kelts
Role of personal and social values in politics. Fall: Problems in the Western (especially American) tradition of political science. Spring: Thinking outside

the Western state: culture, nationalism, ethnic conflict, democratization, international conflict. Admission by special selection process.

101 **Scope and Methods of Political Science** (3) Lebovic, Wahlbeck, Wiley, Voeten, Lawrence
Nature of political inquiry, approaches to the study of politics and government, empirical methods of research. Laboratory fee, $20.

104 **Methods of Public Policy Analysis** (3) Stoker, Balla
Introductory overview of the concepts, issues, and techniques of systematic policy analysis and its role in the policy process.

105–6 **Major Issues of Western Political Thought** (3–3) Creppell, Schwartzberg, Kelts
PSc 105: foundations of Western political thought—Plato to Aquinas. PSc 106: history of political thought from the 16th through the late 19th century, as set forth in the works of representative thinkers.

107 **20th-Century Political Thought** (3) Creppell, Winstead
Recent Western political thought; analysis and critique of the legacies of modern political theories and ideologies.

110 **American Political Thought** (3) Staff
Political thought in the U.S. from colonial times to the present as seen through major representative writings.

111 **State and Urban Politics** (3) Staff
Comparative analysis of context, institutions, processes, and policies of state and urban political systems.

112 **State and Urban Policy Problems** (3) Staff
Selected issues in state and urban policymaking, with emphasis on urban and metropolitan settings.

113 **Judicial Politics** (3) Wahlbeck
An examination of judicial process and behavior. Emphasis on judicial selection, decision making, interaction with the political environment, and impact and implementation of decisions.

114–15 **U.S. Constitutional Law and Politics** (3–3) Wahlbeck
PSc 114: Separation of powers, federal–state relationships, economic regulation. PSc 115: Political and civil rights.

116 **The American Presidency** (3) Maltzman, Lawrence
Examination of the politics of presidential selection, the authority of the contemporary institution, the mechanisms and processes for formulating public policy, and the influences of personality on performance in office.

117 **Executive Branch Politics** (3) Staff
Basic concepts in public administration; influence of bureaucratic politics on policy formulation and implementation. Same as PAd 125.

118 **Legislative Politics** (3) Deering, Maltzman, Binder
Theory, structure, and process of the U.S. Congress, with emphasis on elections, party organization, committees, and floor procedure, in the context of executive–legislative relations and interest-group activities.

119 **U.S. Political Parties and Politics** (3) Binder
Role of parties as a linkage between mass preferences and government policies. Organization, nominations, voting, and activities in legislative and executive branches.

120 **Public Opinion and Political Socialization** (3) Staff
Sources of mass political attitudes and behavior; voting and political campaigning.

121 **U.S. Political Participation** (3) Staff
Examination of the various forms of American political participation in electoral and governmental politics and their effects on the political process.

122 **Science, Technology, and Politics** (3) Logsdon, Rycroft
Multiple impacts of scientific and technological developments on the political systems. Discussion of public policies for support, use, and control of science and technology.

124 **Issues in Domestic Public Policy** (3) Stoker, Balla
Examination of the decision-making process and the substance of various issues in domestic public policy in such areas as crime, economics, education, energy, the environment, poverty, and health.

128 **Media, Politics, and Government** (3) Staff
Same as PCm 128.

129 **Television and Politics** (3) Staff
Examination of the impact of television on American politics and society, the nature of coverage of political issues and campaigns, the dynamics of selecting and presenting news stories. Same as PCm/EMda 129.

130 **Comparative Politics of Western Europe** (3) Feigenbaum and Staff
Comparative political analysis with primary focus on the principal states of Western Europe.

131 **Comparative Politics of Post-Communist States** (3) Wolchik
Countries covered will include some combination of states formerly part of the Soviet Union.

134 **Global Perspectives on Democracy** (3) Brown, Dickson
International experiences with the historical evolution and current nature of democratic political systems.

139 **International Political Economy** (3) Sell, Posner
Analysis of the political aspects of global economic relationships, focusing on such issues as economic hegemony, interdependence, trade relations, development assistance, multinational corporations, and the role of international organizations.

140 **Theories of International Politics** (3) Nau, Lebovic, Goldgeier, East
Exploration of alternative theoretical approaches to understanding world politics in its historical and contemporary dimensions.

142 **International Organizations** (3) Finnemore, Voeten
Development and operations of the United Nations, regional organizations, and functional international organizations.

144 **Public International Law** (3) Smith
Survey of essential principles and concepts of public international law through case analysis and with reference to political factors.

146 **U.S. Foreign Policy** (3) Goldgeier
Constitutional, political, and international factors that determine the formulation, execution, and substance of U.S. foreign policy.

149 **Military Force and Foreign Policy** (3) Avant
Impact of military considerations on U.S. foreign policy; major problems in national security, e.g., strategic weaponry, military assistance, regional security problems.

161 **European–Atlantic Relations** (3) Staff
International politics of the North Atlantic area, the European Common Market, and U.S.–European relations.

167 **Human Rights and Soviet Government** (3) Staff
Human rights theory, the various movements for human, religious, civil, political, and other rights that emerged in the USSR from the early 1960s, and the ways in which the authorities responded to these movements. These themes are traced into the post-Soviet period.

168 **Post-Soviet Foreign Policy** (3) Staff
External problems and policies of Russia and the other successor states of the former USSR (especially the Baltics, Ukraine, and southern rim of the former Soviet Union).

170 **Comparative Politics of China and Northeast Asia** (3) Dickson
Political institutions and processes of China (including Taiwan), Japan, and Korea since World War II. Influence of indigenous traditions and foreign contacts.

173 **Comparative Politics of Southeast Asia** (3) Bowie
Comparative analysis of Southeast Asian politics and economics, with principal focus on the capitalist countries of the region.

175 **International Relations of East Asia** (3) Mochizuki, Shambaugh, Harding
Analysis of the foreign policies of selected East Asian countries and the foreign policies of major powers toward the region.

176 **The Arab–Israeli Conflict** (3) Reich
Origins, evolution, and issues of the Arab–Israeli conflict.

177 **Comparative Politics of the Middle East** (3) Reich, Brown
Politics of the eastern Arab states, Turkey, Iran, and Israel.

178 **International Relations of the Middle East** (3) Reich, Brown
Analysis of the regional and international relations of the Middle East.

179 **Israeli Politics and Foreign Policy** (3) Reich
Examination of the institutions, processes, and issues of Israeli politics and foreign policy.

181 **Comparative Politics of Middle and Southern Africa** (3) Lambright
Comparative analysis of political systems in selected countries of non-Mediterranean Africa.

182 **African International Politics** (3) Lambright
Analysis of interstate relations in Africa and of selected aspects of African relations with the outside world. Recommended prerequisite: PSc 181.

183 **Comparative Politics of Latin America** (3) McClintock
The politics of selected countries in South America, Central America, and the Caribbean. Emphasis on revolutionary movements and democratization.

184 **International Relations of Latin America** (3) McClintock
Emphasis on U.S. foreign policy toward Latin America.

187 **Internship** (1 to 3) Staff
Study of political behavior through internship experience with Congress, executive departments or agencies, politically active private-sector groups, political parties, or electoral campaigns. Admission requires departmental approval and junior standing.

190 **Selected Topics** (3) Staff

191 **Independent Study** (1 to 3) Staff
For departmental majors and minors. Prerequisite: 15 credit hours of 100-level political science courses and approval of the undergraduate program advisor and the faculty member who will direct the study.

192 **Proseminar** (3) Staff
Examination of selected problems in political science. Admission requires departmental approval.

PSYCHOLOGY

Professors E. Abravanel, J. Miller, L.A. Rothblat, R.A. Peterson, P. Wirtz, D. Reiss, C.K. Sigelman, G. Howe (*Research*), L.R. Offermann, P.J. Poppen, E. Hirshman (*Chair*), W.J. Frawley, M.C. Zea
Associate Professors L. Brandt, C.A. Rohrbeck, S. Dopkins, S.D. Molock, J.M. Ganiban, D.P. Costanza, E. Davis, P.J. Moore
Assistant Professors C. Beil (*Research*), N. Vasilopoulos, J.W. Philbeck, D.E. Schell, C. Gee, N. Le, A.N. Zucker, T.L. Dodge, S. Lambert, M.H. Sohn
Adjunct Assistant Professor K. Ross-Kidder
Lecturer P.J. Woodruff

Bachelor of Arts with a major in psychology—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Psyc 1.
3. Required courses in related areas:

(a) Stat 53 or equivalent. Students are encouraged to take a second statistics course to meet the general curriculum requirement in quantitative and/or logical reasoning.

(b) 6 credit hours from one of the following departments: Anthropology, Economics, History, Political Science, or Sociology; an additional 3 credit hours from a different one of these departments or from American Studies, Geography, or Philosophy.

4. Required courses in the major—Psyc 11, 12, 13, 101, 105 or 106, 118 or 121, 196, and four additional 100-level psychology courses. (Only 3 credits of Psyc 191 can be applied toward the major.)

Special Honors—To qualify for graduation with Special Honors the student must fulfill the general requirements stated under University Regulations, submit an application to the Psychology Department before the beginning of the student's senior year, take an honors seminar (Psyc 197) and a 200-level seminar, and complete an independent study project (Psyc 191 or 198) with distinction. The grade-point average in psychology required for graduation with Special Honors is 3.5.

Five-Year Bachelor of Arts with a major in psychology/Master of Arts in the field of art therapy—Students interested in this dual degree program should consult the director of the Art Therapy Program early in the junior year.

Minor in psychology—18 credit hours are required, including Psyc 1, 11, 12, 13, and at least two additional psychology courses other than Psyc 191 or 198. Students considering graduate study in psychology are advised to take Psyc 105 or 106, a distribution of courses from the categories listed under the major above, Psyc 196, and an elementary course in statistics.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Departmental prerequisite: Psyc 1 is prerequisite to all psychology courses.

1 **General Psychology** (3) Staff
Fundamental principles underlying human behavior. (Fall and spring)

11 **Abnormal Psychology** (3) Rohrbeck, Zea, Woodruff, Le
Causes, diagnosis, treatment, and theories of various types of maladjustments and mental disorders. (Fall and spring)

12 **Social Psychology** (3) Poppen, Moore
Social foundations of behavior: cognition, motivation, role behavior, communication, small-group processes, and attitudes. (Fall and spring)

13 **Developmental Psychology** (3) Ganiban and Staff
Introduction to the study of human development; theory and research concerning changes in physical, cognitive, and social functioning and influences on the developing individual. (Fall and spring)

101 **Psychology Research Methods** (3) Rohrbeck, Moore, Zucker
Survey of research designs (e.g., case studies, correlational designs, experiments), methods (e.g., questionnaires, observations), and measurement issues (e.g., reliability and validity). Prerequisite or corequisite: Stat 53. (Fall and spring)

105–6 **Principles and Methods of Psychology** (4–4) Dopkins, Philbeck
Lecture (3 hours), laboratory (3 hours). An experimental approach to understanding behavior; individual and class experiments performed. Psyc 105: visual sensation and perception. Psyc 106: sensation and perception in all modalities. Laboratory fee, $30 per semester. (Academic year)

108 **Humanistic Psychology** (3) Schell
Critical examination of humanistic psychology. Emphasis on role of consciousness in human behavior. Philosophic foundations, existential, phenomenological, and transpersonal psychology. (Fall)

109 **The Psychological Study of Spirituality** (3) Schell
The complex interrelationship between psychology and spirituality: health and wellness; development of a spiritual life; psychological factors involved in spirituality; therapy and multicultural issues. Same as Rel 102. (Spring)

110 **Perception and Understanding in Children** (3) Abravanel
Concepts and research in the area of developmental psychology; emphasis on the growth and development of thinking, perceiving, and symbolic activity. (Spring)

112 **Psychology of Adolescence** (3) Ross-Kidder
Psychological characteristics and problems peculiar to adolescence, with emphasis on application of psychology to solution of such problems. Prerequisite: Psyc 13. (Fall or spring)

114 **Adult Development and Aging** (3) Staff
Psychological aging and development during the adult years, with an emphasis on theories of adult development and research on changes in cognitive functioning and social adjustment in early, middle, and later adulthood. Prerequisite: Psyc 13.

118 **Neuropsychology** (3) Rothblat
Analysis of neural processes underlying behavior. Basic structure and functions of the nervous system, with emphasis on sensory processes, learning and memory, motivation, and emotion. (Fall and spring)

119 **Group Dynamics** (3) Offermann
Relationship of the individual to groups, collectivities, and larger social systems. Theory, research, and applications of group and organizational processes. (Fall and spring)

121 **Memory and Cognition** (3) Philbeck
An examination of the psychological processes underlying human memory and cognition. Topics cover theoretical and experimental issues involving a range of cognitive function from attention and pattern recognition to learning and memory. (Fall and spring)

125 **Cross-Cultural Psychology** (3) Zea
Introduction to the theory, methods, and research of cross-cultural psychology, with emphasis on immigrants and ethnic minorities in the United States and on other cultures. Prerequisite: Psyc 12 or 13. (Spring)

128 **Health Psychology** (3) Peterson, Poppen
Current research in the area of health psychology, with special attention to psychological factors related to health and illness, psychological intervention with medical patients, and psychological approaches to illness prevention and health promotion. (Fall and spring)

129 **Theories of Personality** (3) Poppen
Survey of personality theories; emphasis on their application to problems of individuals. (Fall and spring)

131 **Psychological Tests** (3) Staff
Survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, $25. (Fall and spring)

132 **Socialization in Childhood** (3) Ganiban
Examination of primary methods by which the child is shaped in terms of social judgment and self-control; internalization of controls, assimilation of societal values and parenting procedures. Organized by focus on issues according to developmental level.

144 **Industrial/Organizational Psychology** (3) Offermann, Vasilopoulos
Psychological concepts and methods applied to problems of personnel management, employee motivation and productivity, supervisory leadership, and organizational development. (Fall and spring)

150 **Psychology of Sex Differences** (3) Poppen
Relevant biological, psychological, and sociological influences on males and females in the development of sex differences; hormonal differences, gender identity, differential socialization of sons and daughters, masculinity/femininity, cultural evaluation of male and female roles. Survey of relevant psychological theory. Emphasis on empirical research and hypothesis testing. (Spring)

151 **Theory and Practice of Women's Leadership** (3) Offermann
Same as WLP 151.

152 **Women and Psychology** (3) Zucker
The psychology of women from a variety of perspectives (e.g., biological, cultural, social constructivist). Ways in which mainstream psychology is gendered; various feminist approaches to studying issues of gender in psychology. Same as WStu 152. (Fall)

154 **Psychology of Crime and Violence** (3) Staff
Examination of many psychological aspects of criminal behavior; personality of criminals and of psychological processes affecting behavior. (Fall and spring)

156 **Psychology of Attitudes and Public Opinion** (3) Poppen
Psychology of opinion formation, measurement of opinion, social determinants of attitudes, psychological processes in propaganda, bases of receptivity to propaganda, psychological warfare.

170 **Clinical Psychology** (3) Zea, Peterson
An exploration of the history, functions, and concerns of the clinical psychologist. Assessment, treatment, community approaches, ethics. Prerequisite: Psyc 11.

188 **Attitudes Toward Death and Dying** (3) Woodruff
Exploration of the many different aspects, attitudes, and experiences associated with the process of death and dying. (Fall and spring)

191 **Independent Research** (3) Staff
Opportunity for work on individual library or experimental projects. Open to qualified students by permission; arrangements must be made with the sponsoring faculty member prior to registration. A list of participating faculty members and their research specialties is available from the Department. May be repeated twice for credit. Prerequisite: Psyc 101. (Fall and spring)

192 **Field Experience** (3) Abravanel
Senior psychology majors will spend a minimum of six hours a week in a local mental health, rehabilitation, school, or community setting. Students registering for this course must have weekly blocks of time available in their class schedules. (Fall and spring)

193 **Seminar in Industrial/Organizational Psychology** (3) Offermann, Vasilopoulos
Selected specialized topics in the field of psychology and work behavior, such as human ability and personality, decisions and risk behavior, organizational change, and leadership. May be repeated for credit. Prerequisite: Psyc 144 or permission of instructor.

196 **History and Systems of Psychology** (3) Staff
Senior capstone course that includes a survey and integration of the major viewpoints and concepts of psychology. Required of psychology majors. (Fall and spring)

197 **Honors Seminar** (3) Staff
Selected topics in psychology that change each semester. Intended primarily for students in the Special Honors program in psychology. May be repeated once for credit. Prerequisite: Psyc 101. (Fall and spring)

198 **Current Research Issues** (3) Staff
Conducted as a seminar. Recent experiments in psychology, including those performed by members of the class; emphasis on student participation. May be repeated once for credit. Prerequisite: Psyc 101.

199 **Current Topics in Psychology** (3) Staff
Topics vary. May be repeated for credit provided the topic differs.

PUBLIC ADMINISTRATION

Programs in public administration are offered at the graduate level by the School of Public Policy and Public Administration in Columbian College of Arts and Sciences. The course listed here is open to undergraduates.

117 **Executive Branch Politics** (3) Staff
Contemporary concepts and issues in public administration and management. Major trends and approaches to governmental administration in the U.S., including the changing federal role, roles of the public sector in relation to the private sector, and managing public agencies at all levels. Same as PSc 117. (Fall and spring)

PUBLIC HEALTH

Undergraduate Program Committee: P. Sullivan (*Director*), C. Battle, J. Cawley, M. Edberg, D. Goldsmith, R. Riegelman, W. Schroth, J. Teitelbaum, S. Wilensky, R. Skolnik

See the School of Public Health and Health Services for the program of study leading to the Bachelor of Science with a major in public health. The following courses are also available to undergraduates in other schools and may be used toward a secondary field in public health. Check with the SPHHS Student Services Office for any prerequisites that may apply.

101 **Introduction to Public Health and Health Services** (3)
Introduction to aspects of public health and health services, including health services administration and policy, maternal and child health, environmental health, and health promotion.

102 **Biological Basis of Public Health** (3)
Basic science principles of anatomy, physiology, and pathophysiology and their applications to public health.

103 **Introduction to Preventive Medicine** (3)
Introduction to the clinical science basis of preventive medicine, including nutrition, infectious diseases, immunology, and human growth and development. Overview of the goals and methods used for disease prevention.

105 **History and Philosophy of Public Health** (3)
Historical and philosophical development of public health and its contributions to understanding, preventing, and controlling disease and disabilities.

121 **Principles of Health Education and Health Promotion** (3)
Introduction to principles and concepts of health education and the role of the health educator in public health practice settings. Foundations of health promotion; communicating health concepts to the public, with a focus on strategies for developing health messages for specific populations.

132 **Epidemiology: Measuring Health and Disease** (3)
Principles of epidemiology applied to disease surveillance, control of infectious and chronic diseases, and health services/health policy. Understanding the basic research designs and their relationship to establishing cause and effect and effectiveness of interventions to prevent and cure disease.

170 **Introduction to Toxicology and Pharmacology** (3)
Basic principles underlying the absorption, distribution, metabolism, and excretion of toxic substances. Mechanisms of toxicity, including mutagenesis, carcinogenesis, and specific organ toxicity.

171 **Introduction to Environmental–Occupational Health Sciences** (2 or 3)
Introduction to principles of environmental and occupational health sciences, including principles of inorganic and organic chemistry.

172 **Health and Environment** (3)
Introduction to environmental and occupational health and implications for individual and population health. Issues of clean water, environmental toxins, air pollution, and the environmental impact on infectious diseases.

180 **Introduction to Global Health and Development** (3)
Basic concepts of development theory, international health policy, demographic trends, and health promotion; how the relationships between socioeconomic development and global health can be observed, measured, and used for the management of health programs.

181 **Ecology, Health, and Social Development** (3)
Survey of the relationship between health and development and environmental trends. Topics include deforestation, urban contamination, and desertification.

182 **Health, Human Rights, and Displaced Persons** (3)
Concepts of health as a human right, ethics, and the participation of the international community in moving toward health for all. Civil and international conflict in the generation of displaced populations.

183 **Global Delivery of Health Systems** (3)
Introduction to health systems and the basic concepts of health systems administration and financing and health care reform with examples from advanced, middle income, and poor countries.

184 **International Public Health Practice** (3)
Global challenges of new and re-emerging infectious diseases and the health of travelers. Use of health information in the context of globalization and public health practice. International aspects of medical and public health training.

185 **Impact of Culture Upon Health** (3)
Relationships between cultural values and the development of modern health systems based on Western models of health care practice. Reliance upon traditional forms of health care. Examples of successful incorporation of traditional practices into evolving health care systems.

190 **Topics in Public Health** (1 to 3)
Topics announced in the *Schedule of Classes.* May be repeated for credit provided the topic differs. Various offerings each semester.

191 **Introduction to Health Policy** (3)
An introduction to the fundamentals of the health care system in the United States and strategies available to policymakers when addressing problems relating to access, financing, and delivery of health care.

192 **Introduction to Health Law** (3)
Introduction to the legal concepts that underlie the health system, health care delivery, and health policy in the United States.

195 **Case Studies in Public Health** (3)
An interdisciplinary approach to understanding the complexities inherent in improving public health. Case studies examine the multiplicity of social factors that affect health and working models of approaches to alter them favorably.

199 **Independent Study** (1 to 3)
Admission by permission of instructor and program director.

RELIGION

University Professor S.H. Nasr
Professors H.E. Yeide, Jr., D.D. Wallace, Jr., A.J. Hiltebeitel (*Chair*)
Associate Professors P.B. Duff, R.J. Eisen
Assistant Professor T. Michael
Assistant Professorial Lecturers L.G. Berner, S.M. Glazer, B.N. Hebbar, E.C. Hostetter

Bachelor of Arts with a major in religion—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Rel 1, 2.
3. Required courses in the major—30 credit hours, including at least 21 hours of upper-level courses. Twelve of these hours must be chosen from one religious tradition, such as Buddhism, Christianity, Hinduism, Islam, Judaism. Appropriate graduate seminars may be approved as substitutions for advanced-level courses. The program must include Rel 101 and at least one course each in Hebrew Scriptures and in New Testament.

Special Honors are awarded to students who meet the requirements stated under University Regulations, maintain a grade-point average of 3.4 in courses in the major, and complete an honors thesis by enrolling in Rel 191.

It is recommended that students include the study of foreign languages in their undergraduate program, including a language crucial to one of the religious traditions. All students expecting to enter graduate school are urged to study French or German.

Minor in religion—Required: a minimum of 18 credit hours in religion, of which at least 6 must be upper-level courses. The minor program will be developed in consultation with the departmental advisor. Rel 101 is strongly recommended for all participating students.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

1 **Introduction to World Religions: West** (3) Staff
Examination of the religions of the ancient Mediterranean and the major religions of the West. Religious foundations of Western civilizations. The development of Judaism, Christianity, and Islam and their confrontations with secularization and political upheaval in the modern world. (Fall and spring)

2 **Introduction to World Religions: East** (3) Staff
Examination of the major religions of the East and comparison with religions in the West. Approaches to the cross-cultural study of religion. Hinduism, Buddhism, and the religions of Tibet, China, and Japan are studied with respect to their history and their encounter with modernity. (Fall and spring)

9 **Bible: Hebrew Scriptures** (3) Duff
The literature, history, and religious thought represented by the Hebrew Scriptures (Old Testament). Continuities and contrasts between Israel and the ancient Near East are considered through study of the world view, oral and literary tradition, main religious ideas, and chief figures and movements of the biblical literature. (Fall and spring)

10 **Bible: New Testament** (3) Duff
Literature and history of earliest Christianity in the setting of the religious movements of the Greco-Roman world and developments within Judaism. The meaning of the earliest Christian proclamation about the significance of the life, teaching, and death of Jesus of Nazareth becomes the basis for tracing the formation and expansion of the Christian movement. (Fall and spring)

101 **Theories in the Study of Religion** (3) Yeide
Seminar taught jointly by the faculty of the Department of Religion. Analysis of different ways in which religious phenomena can be approached. Readings and discussion of some of the epoch-making books in the development of the study of religion. (Fall)

102 **The Psychological Study of Spirituality** (3) Staff
Same as Psyc 109.

103 **Biblical Issues** (3) Duff
Critical examination of a selected biblical topic or text.

104 **Jesus** (3) Duff
Comprehensive study of the life and teachings of Jesus with critical attention to sources. Quest for the historical Jesus.

105 **Paul** (3) Duff
Backgrounds of early Christianity, first-century religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's presentation of the Christian faith.

106 **Judaism** (3) Eisen
A survey of Jewish thought and practice from the biblical to the modern period; introduction to the Hebrew Bible, rabbinic Judaism, Jewish philosophy and mysticism, Judaism in the modern period; an examination of the central rituals in Judaism, including Sabbath, dietary laws, and major festivals. (Fall)

107 **Rabbinic Thought and Literature** (3) Eisen
An examination of the thought and literature of rabbinic Judaism in its formative period, 100–500 CE, through a close reading of primary texts in translation; the development of early rabbinic law and theology is explored in the Mishnah, Talmud, and Midrash.

111 **Myth, Epic, and Novel** (3) Hiltebeitel
Religious themes and images of the hero and their cultural significance in literature: e.g., Indo-European, Biblical, Babylonian narrative traditions; Greek epic and drama; Dante, Milton, Dostoevsky, Kafka, Hesse, Faulkner, Beckett.

112 **Jewish Mysticism** (3) Eisen
A historical treatment of the major forms of Jewish mysticism: the ecstatic schools of Merkavah mysticism, medieval German pietism, and Abraham Abulafia; the theosophic mysticism of medieval French and Spanish Kabbalah, Lurianic Kabbalah, and modern Hasidism; examination of major concepts, such as God, man, Israel, Torah, and redemption, as understood by these schools.

113 **Second Temple/Hellenistic Judaism** (3) Duff
History of Judaism from the time of Ezra through the destruction of Jerusalem in 70 CE—canonization of the Pentateuch, Hellenism, Maccabean revolt, growth of sectarian movements, Herod, ferment against Rome in context of Eastern and Western political currents. Use of primary sources, especially the Bible, Josephus, and noncanonical writings.

115 **Jewish Philosophy in the Medieval Period** (3) Eisen
An exploration of Jewish philosophical thinking from the close of the rabbinic period to the end of the Middle Ages through an analysis of four major philosophers—Saadiah, Judah Halevi, Maimonides, and Gersonides. Topics include the nature of God, creation, divine providence, prophecy, and the rationale for the biblical commandments.

116 **Modern Jewish Thought** (3) Eisen
Transformation of community and beliefs among Jews beginning with catalyst of their political emancipation. Responses to beginnings of modernity among Jews in Europe, America, and Israel.

117 **Seminar: Issues in Jewish Thought** (3) Eisen
In-depth exploration of a selected thinker or issue in Jewish thought. Recommended for students with academic background in the study of religion or Judaic studies.

118 **Women in Judaism** (3) Staff
Jewish women's spirituality as reflected in personal writings, ritual, liturgy, and midrash. Jewish women's history and legal status. Same as WStu 150.

120 **The Religions Wage Peace** (3) Yeide
Resources in various world religions that contribute to peacemaking in both interpersonal and political settings. Ways in which the religions have sponsored and/or tolerated violence.

121 **Ethics and the World Religions** (3) Yeide
Modern concepts of ethics and their relation to major world religions; religion as stimulus and barrier to moral change; modern moral issues and religious ethics.

122 **Christian Ethics and Modern Society** (3) Yeide
Nature and principles of Christian life as developed by the Christian community; problems of personal conduct; application to various social institutions.

123 **Issues in Jewish Ethics** (3) Staff
Exploration of current debates about major ethical issues among Jewish thinkers in the Orthodox, Conservative, and Reform denominations; issues in bioethics, feminism, attitudes towards non-Jews, social action, the ethics of war.

134 **The Holocaust in Theology and Literature** (3) Eisen, Ticktin
Theological and literary reactions of Jewish thinkers to the Holocaust; emphasis on evaluating contemporary responses to the Holocaust in light of attitudes toward suffering in the classical Jewish tradition; readings include Fackenheim, Rubinstein, Wiesel, and Appelfeld.

143 **Christianity in the Ancient World** (3) Wallace
Rise and development of Christianity in relation to the culture, philosophy, mystery religions, and general religious life of the Greco-Roman world to A.D. 500.

144 **Medieval Faith and Symbolism** (3) Wallace
Christian life and thought in the Middle Ages; mystics, saints, popes, and philosophers.

145 **Religion in the Renaissance and Reformation** (3) Wallace
Transformation of the Western understanding of human identity and destiny from the end of the Middle Ages to the Age of Reason.

146 **Christianity in the Modern World** (3) Wallace
Changes in Christian life and thought since 1700, as seen in theology, literature, political life, and religious institutions.

151 **The Minor Religions of India** (3) Hebbar
The history, doctrines, and practices of Zoroastrianism, Jainism, Indian Judaism, Indian Christianity (Nestorian, Jacobite, Catholic, and Protestant), Indian Islam, and Sikhism.

152 **South Asian Buddhism** (3) Hebbar
The life of Buddha, the Buddhist Councils, doctrines of the schools of Hinayana Buddhism, philosophies of the schools of Indian Mahayana Buddhism, history of Buddhism in Sri Lanka, early history of Tibetan Buddhism, and the decline of Buddhism in India.

155 **Religion, Myth, and Magic** (3) Staff
Same as Anth 155.

156 **The Goddess in India and Beyond** (3) Hiltebeitel
The goddess traditions of Hinduism, with some attention to goddess traditions in the ancient Near East and the Mediterranean. Classical Sanskritic, Tantric, and popular expressions of Hindu goddess worship. Comparative studies and issues of gender.

157 **Indian Philosophy and Mysticism** (3) Hiltebeitel
Indian speculative and mystical traditions; late *Vedas, Upanishads, Bhagavad Gita,* Buddhist, and Hindu soteriological systems.

158 **Hinduism** (3) Hiltebeitel
Study of continuity and change in Hinduism, with emphasis on historical development and the consolidating features of the religion. Attention to relations between classical and popular living forms.

159 **Mythologies of India** (3) Hiltebeitel
The lore of Indian gods (Vedic, Puranic), heroes (epics), and holy men (Hindu, Buddhist, Jain, Tantric); ties with Indian art, caste, cult, cosmology, and spiritual ideals.

160 **Buddhism** (3) Hiltebeitel
Origin, development, and contemporary status of Buddhist life and thought; its impact on Asia.

161 **Islam** (3) Nasr
Origin, development, and contemporary status of Islamic life and thought; its impact on the Near East.

163 **Islamic Religion and Art** (3) Nasr
Investigation of major forms of Islamic art, such as calligraphy, architecture, and urban design; Quranic chanting, poetry, and music in relation to the principles of Islamic revelation. Same as AH 119.

164 **Islamic Philosophy and Theology** (3) Nasr
The major schools of Islamic philosophy and theology, considered in both a morphological and historical manner. The relation between revelation and reason, determination and free will, and divine and human knowledge as well as the relation among science, philosophy, and religion. The development of various schools of thought, from the classical period to the present.

165 **Sufism (Islamic Mysticism)** (3) Nasr
The foundation of Sufism in the Quranic revelation, its subsequent development, and its significance within Islamic civilization. Doctrines and practices of Sufism; history of the Sufi orders; Sufi literature, particularly in Arabic and Persian. The influence of Sufism upon social and political life and its state and role in the contemporary world, both Islamic and non-Islamic.

172 **Religion in the United States** (3) Wallace
Growth of religious groups and institutions in relation to American culture, development of religious thought, and analysis of the contemporary religious scene.

174 **American Judaism** (3) Staff
Religious thought and institutions with emphasis on contemporary Judaism. Mythic and ritual life of American Jews, including responses to Israel, diaspora, the Holocaust, family and community dynamics.

181 **Women in Western Religion** (3) Staff
Historical, theological, and ethical investigation of the image and role of women in Judaism and Christianity; special consideration of the Biblical experience, the sexual qualifications for religious office, use of male and female images and languages, and contemporary issues. Same as WStu 181.

185 **Early Daoist Religion** (3) Michael
Early history of the formation and development of Daoism through a close reading of foundational texts such as the Daodejing and Zhuangzi.

186 **Shamanism with an Emphasis on China** (3) Michael
Modern constructions of the shaman and shamanism and application to culturally diverse phenomena.

188 **Confucian Religion** (3) Michael
The formation and development of the Confucian religious tradition. Same as Chin 188.

190 **Selected Topics** (3) Staff
Critical examination of religious phenomena rendered timely by current events or special resources. Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

191 **Senior Honors Thesis** (3) Staff
Required of and open only to undergraduate honors candidates in religion. (Fall and spring)

ROMANCE LANGUAGES AND LITERATURES

Professors I. Azar, J.F. Thibault, G. Ludlow (*Chair*)
Associate Professors G.P. Huvé, Y. Captain, I.R. Vergara, J.J. Hampton, E. Echeverria, C. Britt
Assistant Professors M. Ferretti, L. Chang, M. Belenky, S. Waisman
Instructors A. Serrano-Ripoll, J. Brant

Bachelor of Arts with a major in French language and literature—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Fren 1, 2, 3, 4, 9, 10, 30, or equivalent.
3. Required for the major—30 credit hours consisting of two courses selected from Fren 53, 54, 90; six 10-level courses in French, with at least four in literature, distributed as indicated immediately below; and, in the senior year, Fren 199–200 and a comprehensive examination. The six 100-level courses must include one in literature before 1700 (chosen from Fren 120, 121, 122), two in literature since 1700 (chosen from Fren 123, 124, 125), and three chosen from among all 100-level French courses, with at least one in literature.

Bachelor of Arts with a major in Hispanic languages and literatures—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Span 1, 2, 3, 4, 9, 10, 30, or equivalent.
3. Required for the major—30 credit hours consisting of two courses selected from Span 53, 54, 90; six 100-level courses in Spanish, with at least four in literature, distributed as indicated immediately below; and, in the senior year, Span 199–200 and a comprehensive examination. The six 100-level courses must include two in literature before 1800 (chosen from Span 120, 121, 122, 123, 124, 149), two in literature since 1800 (Span 125, 126, 130, 131, 132, 140, 145, 146, 147, 148, 150), and two chosen from among all 100-level Spanish courses.

Special honors—In addition to the general requirements stated under University Regulations, a candidate for special honors in French or Hispanic languages and literatures must have attained a 3.75 GPA in the major and at least a 3.0 average overall. Qualified students should consult their major advisor and proseminar professor by the beginning of the fall semester of the senior year to indicate their intention to write an honors thesis.

Minor in French or Hispanic languages and literatures—Required: 21 credit hours in one of the two fields, consisting of three courses chosen from Fren/Span 30, 53, 54, 90; four additional courses selected from among French/Spanish courses numbered 9 and above, including at least two at the 100 level.

Minor in Italian language and literature—Required: 21 credit hours consisting of Ital 9, 10, 30, 53, 54, 120, 131.

Placement Examinations: A student who has not been granted advanced standing and who wishes to continue in college the language begun in high school must take a placement examination before registration. Upon completion of the examination, assignment is made to the appropriate course.

Departmental prerequisite: Prerequisites are listed with each course up to 110; courses numbered 120 and higher have prerequisites of two courses from 53, 54, 90, or approval of the instructor.

Note: In general, Romance language courses are conducted entirely in the language concerned. Aural comprehension, speaking, reading, and writing are the basis of all courses through Fren/Ital/Port/Span 10, with culture integrated from the start as an essential dimension of language acquisition.

FRENCH

1 **Basic French I** (4) Staff
Handling the immediate context of daily experience in spoken and written French: identifying, describing, and characterizing people, objects, places, and events; giving information and instructions; issuing simple commands and requests. Laboratory fee, $50. (Fall, spring, and summer)

2 **Basic French II** (4) Staff
Speaking and writing in French about past and future events: telling a story (narrating and describing in the past), promising, predicting, and proposing simple hypotheses and conjectures. Prerequisite: Fren 1 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

3 **Intermediate French I** (3) Brant and Staff
Increasing active vocabulary, reinforcing mastery of basic grammar, dealing with more complex structures (verbal phrases, subordinate clauses), and using some patterns of indirect speech (e.g., repeating or relaying messages, giving reports, summarizing). Prerequisite: Fren 2 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

4 **Intermediate French II** (3) Brant and Staff
Consolidation and further expansion of the ability to understand as well as produce a more complex level of oral and written discourse emphasizing subjective expression: issuing indirect commands and requests; giving opinions; making proposals, building arguments; defending and criticizing ideas. Prerequisite: Fren 3 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

9 **Language, Culture, and Society I** (3) Huvé and Staff
Development of strong conversational skills and the rudiments of expository writing. The vocabulary and structures necessary to move from handling everyday experience and subjective expression to the exposition of more abstract thought and ideas and discussion of political, social, and cultural issues. Prerequisite: Fren 4. Laboratory fee, $50. (Fall, spring, and summer)

10 **Language, Culture, and Society II** (3) Huvé and Staff
Continued expansion of the range and complexity of conversational skills and further development of the writing of effective expository prose on a broad range of subjects. Short literary texts serve as the basis for oral discussion, analytical reading, and writing brief critical essays. Prerequisite: Fren 9. Laboratory fee, $50. (Fall, spring, and summer)

20 **French Pronunciation** (3) Huvé
The sounds of French. Oral readings, presentations, recitation. Poetry, scenes from plays. Emphasis on phonetics and diction, with attention to accent, rhythm, and intonation. Prerequisite: Fren 10. Laboratory fee, $50. (Spring)

30 **Introduction to French Literature** (3) Belenky, Brant, Chang
Readings, textual analysis, and writing on a broad selection of texts from different genres and periods. French and Francophone literatures in their cultural contexts. Close reading approach and introduction to literary vocabulary. Prerequisite: Fren 10. (Fall and spring)

49 **French for Graduate Students** (0) Staff
For graduate students preparing for reading examinations. No academic credit. Tuition is charged at the rate of 3 credit hours. (Fall, spring, and summer)

53 **Medieval and Early Modern French Literature in Context** (3) Chang and Staff
Texts of the Middle Ages to the 17th century studied in their historical, social, and cultural contexts. Topics may include feudal society and the literature of courtly love; humanism, Rabelais, and Renaissance poetry; women and salon writing; Versailles, absolutism, and classical theater. Prerequisite: Fren 30 or equivalent. (Fall)

54 **Modern French Literature in Context** (3) Ludlow and Staff
Texts of the 18th century to the present in historical, social, and cultural contexts. Topics may include *philosophes* and the rise of social consciousness; the French Revolution and Romanticism; dada and surrealism; existentialism and World War II; decolonization and francophone literature. Prerequisite: Fren 30 or equivalent. (Spring)

56 **Topics in French and Francophone Literatures and Cultures in Translation** (3) Ludlow, Belenky, Thibault, Chang
Dynamics of French-speaking societies and their cultures studied through literature, art, or film. Topics vary. Readings and lectures in English. The course may be repeated for credit. A laboratory fee may be required. (Spring)

90 **Textual Analysis** (3) Thibault and Staff
Methodology and vocabulary of literary criticism. Application of various principles of textual analysis and critical approaches to literature. Prerequisite: Fren 30 or equivalent. (Spring)

108 **Advanced French Grammar and Style** (3) Brant and Staff
Composition, drills, dictations. Translations into French. Study of vocabulary and syntax, with emphasis on stylistic devices. Prerequisite: Fren 10. (Fall)

109 **Contemporary France** (3) Huvé and Staff
Emphasis on advanced oral work. Discussion of French culture and civilization, based on contemporary writings and video documents. Prerequisite: Fren 10. Laboratory fee, $50. (Fall)

110 **Business and Commercial French** (3) Huvé
Structure and language of French economic institutions. Discussion of legal, financial, and administrative documents. Oral and written reports. Preparation for the certificate of the Paris Chamber of Commerce. Prerequisite: Fren 10. (Spring)

120 **Studies in Medieval French Literature** (3) Chang
Readings and analysis of the major literary texts from the 11th through 15th centuries. Chansons de geste, courtly literature, fabliaux, drama, lyric and didactic poetry.

121 **French Literature of the Renaissance** (3) Chang
Sixteenth-century prose and poetry in the context of cultural and historical movements. Topics may include humanism; concepts of self and subjectivity; the wars of religion; the discovery of the New World; court and city life; the private and public spheres; religious and secular love. (Fall, alternate years)

122 **The Age of Classicism** (3) Ludlow
Drama, philosophy, criticism, poetry, and fiction of the 17th century. Topics may include *préciosité*, baroque, Jansenism, classicism, and rationalism in the context of the major social, political, and religious movements of the period. (Spring, alternate years)

123 **The Age of Enlightenment** (3) Ludlow
The major novelists, dramatists, and *philosophes* of the 18th century. The works of Montesquieu, Voltaire, Rousseau, and Diderot and their relationship to the social, political, and philosophical thought of the period. (Fall, alternate years)

124 **19th-Century French Literature and Culture** (3) Belenky
Key aspects of 19th-century French literature in its historical, cultural, and political context. Major authors and literary movements are studied through the lens of a particular theme, which varies from year to year. (Fall, alternate years)

125 **Studies in 20th-Century French Literature** (3) Thibault
Major literary movements of the 20th century: avant-garde, surrealism, existentialism, *nouveau roman,* and *nouveau théâtre.* (Spring)

130 **Studies in Genre** (3) Thibault, Ludlow, Chang, Belenky
Study in narrative, dramatic, or lyric form. Topics vary. May be repeated for credit. (Spring)

131 **Topics in the History of French Cinema** (3) Thibault
French cinema from its inception to the "New Wave." The relationship of filmmaking and audience reception to the evolution of French society and political institutions. The language of cinema as it evolves according to periods and genres and as critics and filmmakers create a theoretical discourse specific to film. Laboratory fee, $30. (Spring)

132 **Topics in 20th-Century Francophone Literature and Cinema** (3) Ludlow
Analysis of relations between France and its former colonies as manifested in the literature and cinema of France and the Francophone world. Race and gender relations; exile; nationalism; and identity and place as seen through various literary and cinematic responses to the discourses of metropolitan France by its former colonies. Laboratory fee, $30. (Fall, alternate years)

133–34 **Special Topics in French Literature** (3–3) Staff
May be repeated for credit provided the topic differs.

140 **Writing Women** (3) Belenky, Chang
Dynamics of gender in French literature and culture with emphasis on women as agents and objects of representation. Gender roles in the formation of social biases, norms, and power structures. Texts range from the Middle Ages to the present. (Fall, alternate years)

197 **Independent Study** (arr.) Staff
Admission by permission of department chair and instructor. May be repeated for credit.

199–200 **Proseminar** (3–3) Thibault and Staff
Required of all majors; preparation for the major field examination. Literature in relation to the other arts and the social sciences. Fren 199: textual analysis, literary criticism, theory, and methods. Fren 200: the concepts of literary history and the history of French literature; periods, authors, genres, topics. (Academic year)

ITALIAN

1 **Basic Italian I** (4) Ferretti and Staff
Handling the immediate context of daily experience in spoken and written Italian: identifying, describing, and characterizing people, objects, places, and events; giving information and instructions; issuing simple commands and requests. Laboratory fee, $50. (Fall, spring, and summer)

2 **Basic Italian II** (4) Ferretti and Staff
Speaking and writing in Italian about past and future events: telling a story (narrating and describing in the past), promising, predicting, and proposing simple hypotheses and conjectures. Prerequisite: Ital 1 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

3 **Intermediate Italian I** (3) Ferretti and Staff
Increasing active vocabulary, reinforcing mastery of basic grammar, dealing with more complex structures (verbal phrases, subordinate clauses), and using some patterns of indirect speech (repeating or relaying messages, giving reports, summarizing). Prerequisite: Ital 2 or equivalent. Laboratory fee, $50. (Fall)

4 **Intermediate Italian II** (3) Ferretti and Staff
Consolidation and further expansion of the ability to understand as well as produce a more complex level of oral and written discourse emphasizing subjective expression: issuing indirect commands and requests; giving opinions; making proposals, building arguments; defending and criticizing ideas. Prerequisite: Ital 3 or equivalent. Laboratory fee, $50. (Spring)

9 **Language, Culture, and Society I** (3) Ferretti and Staff
Development of strong conversational skills and the rudiments of expository writing. The vocabulary and structures necessary to move from handling everyday

experience and subjective expression to the exposition of more abstract thought and ideas and discussion of political, social, and cultural issues. Prerequisite: Ital 4. Laboratory fee, $50.

10 **Language, Culture, and Society II** (3) Ferretti and Staff
Continued expansion of the range and complexity of conversational skills and further development of the writing of effective expository prose on a broad range of subjects. Short literary texts serve as the basis for oral discussion, analytical reading, and writing brief critical essays. Prerequisite: Ital 9. Laboratory fee, $50.

30 **Introduction to Italian Literature** (3) Ferretti
Readings, textual analysis, and writing on a broad selection of texts from different genres and periods. Emphasis on study of Italian literature in its cultural context. Close reading approach and introduction to literary vocabulary. Prerequisite: Ital 10 or equivalent. (Fall)

53 **History of Italian Literature from the Middle Ages Through the 17th Century** (3) Ferretti and Staff
Lecture and discussion in Italian. Development of genre and movements. Selected readings across these periods plus reading of complete texts of epics, essays, novels, and plays. Prerequisite: Ital 10 or equivalent. (Fall)

54 **History of Italian Literature from the 18th Through the 20th Century** (3) Ferretti
Lecture and discussion in Italian. Philosophical and literary movements of the modern period. Selected readings across the period plus the reading of complete texts of novels and drama. Prerequisite: Ital 10 or equivalent. (Spring)

56 **Italian Literature and Culture in Translation** (3) Staff
Dynamics of Italian-speaking societies and their cultures studied through literature, art, or film. Topics vary. Readings and lectures in English. The course may be repeated for credit. A laboratory fee may be required. (Fall)

90 **Textual Analysis** (3) Ferretti
Close examination of critical methods and vocabulary used in literary study as applied to Italian Literature. Attention to linguistic and stylistic difficulties in textual analysis. Prerequisite: Ital 30 or equivalent. (Spring)

108 **Advanced Italian Grammar and Style** (3) Ferretti
Compositions, drills, dictations. Translations into Italian. Study of vocabulary and syntax with emphasis on stylistic devices. Prerequisite: Ital 10. (Fall)

120 **Studies in Medieval and Early Renaissance Literature** (3) Ferretti
Works by Dante, Petrarca, and Boccaccio. Emphasis on structure, rhetorical features, and problems of narrative organization. Specific attention to historical and ideological aspects of the works as well as to cultural influence. Prerequisite: Ital 90 or equivalent.

131 **The Italian Novel** (3) Ferretti and Staff
A reading of the most important Italian novelists of the 19th and the 20th centuries: Manzoni, Verga, Bassani, Calvino, Eco, Sanguinetti. Study of the relations of each work to its social and cultural context and to the novel as a genre. Prerequisite: Ital 90 or equivalent.

197 **Independent Study** (arr.) Staff
Admission by permission of department chair and instructor. May be repeated for credit.

PORTUGUESE

1 **Basic Portuguese I** (4) Byrnes
Handling the immediate context of daily experience in spoken and written Portuguese: identifying, describing, and characterizing people, objects, places, and events; giving information and instructions; issuing simple commands and requests. Laboratory fee, $50. (Fall)

2 **Basic Portuguese II** (4) Byrnes
Speaking and writing in Portuguese about past and future events: telling a story (narrating and describing in the past), promising, predicting, and proposing simple hypotheses and conjectures. Prerequisite: Port 1 or equivalent. Laboratory fee, $50. (Spring)

3 **Intermediate Portuguese I** (3) Byrnes
Increasing active vocabulary, reinforcing mastery of basic grammar, dealing with more complex structures (verbal phrases, subordinate clauses), and using

some patterns of indirect speech (repeating or relaying messages, giving reports, summarizing). Prerequisite: Port 2 or equivalent. Laboratory fee, $50. (Fall)

4 **Intermediate Portuguese II** (3) Byrnes
Consolidation and further expansion of the ability to understand as well as produce a more complex level of oral and written discourse emphasizing subjective expression: issuing indirect commands and requests; giving opinions; making proposals, building arguments; defending and criticizing ideas. Prerequisite: Port 3 or equivalent. Laboratory fee, $50. (Spring)

8 **Portuguese for Spanish Speakers** (3) Byrnes
An intensive course designed for speakers of Spanish to develop competence quickly in spoken and written Portuguese. Laboratory fee, $50. (Spring)

9 **Language, Culture and Society I** (3) Byrnes
Development of strong conversational skills and the rudiments of expository writing. The vocabulary and structures necessary to move from handling everyday experience and subjective expression to the exposition of more abstract thought and ideas and discussion of political, social, and cultural issues. Prerequisite: Port 4. Laboratory fee, $50. (Fall)

SPANISH

1 **Basic Spanish I** (4) Echeverria and Staff
Handling the immediate context of daily experience in spoken and written Spanish: identifying, describing, and characterizing people, objects, places, and events; giving information and instructions; issuing simple commands and requests. Laboratory fee, $50. (Fall, spring, and summer)

2 **Basic Spanish II** (4) Echeverria and Staff
Speaking and writing in Spanish about past and future events: telling a story (narrating and describing in the past), promising, predicting, and proposing simple hypotheses and conjectures. Prerequisite: Span 1 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

3 **Intermediate Spanish I** (3) Serrano-Ripoll and Staff
Increasing active vocabulary, reinforcing mastery of basic grammar, dealing with more complex structures (verbal phrases, subordinate clauses), and using some patterns of indirect speech (repeating or relaying messages, giving reports, summarizing). Prerequisite: Span 2 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

4 **Intermediate Spanish II** (3) Serrano-Ripoll and Staff
Consolidation and further expansion of the ability to understand as well as produce a more complex level of oral and written discourse emphasizing subjective expression: issuing indirect commands and requests; giving opinions; making proposals, building arguments; defending and criticizing ideas. Prerequisite: Span 3 or equivalent. Laboratory fee, $50. (Fall, spring, and summer)

5–7 **GW Madrid Study Center: Spanish Language and Culture I–II–III** (3–3–3) Staff
Offered through the Madrid Program only.

9 **Language, Culture, and Society I** (3) Echeverria and Staff
Development of strong conversational skills and the rudiments of expository writing. The vocabulary and structures necessary to move from handling everyday experience and subjective expression to the exposition of more abstract thought and ideas and discussion of political, social, and cultural issues. Prerequisite: Span 4. Laboratory fee, $50. (Fall, spring, and summer)

10 **Language, Culture, and Society II** (3) Echeverria and Staff
Continued expansion of the range and complexity of conversational skills and further development of the writing of effective expository prose on a broad range of subjects. Short literary texts serve as the basis for oral discussion, analytical reading, and writing brief critical essays. Prerequisite: Span 9. Laboratory fee, $50. (Fall, spring, and summer)

30 **General Readings in Spanish Literature** (3) Echeverria and Staff
Readings, textual analysis, and writing on a broad selection of texts from different genres and periods. Hispanic literatures in their cultural contexts. Close reading approach and introduction to literary vocabulary. Prerequisite: Span 10. (Fall and spring)

49 **Spanish for Graduate Students** (0) Staff
For graduate students preparing for reading examinations. No academic credit. Tuition is charged at the rate of 3 credit hours. (Fall, spring, and summer)

53 **Epic and Satire** (3) Britt, Hampton, Vergara
The historical, cultural, and political ties between Spain and Latin America and their representation in epic and satiric modes of imaginative literature as developed in drama, poetry, and prose. Lecture and discussion in Spanish. Prerequisite: Span 30 or equivalent. (Fall)

54 **Tragedy and Comedy** (3) Britt, Hampton, Vergara
The historical, cultural, and political ties between Spain and Latin America and their representation in tragic and comic modes of imaginative literature as developed in drama, poetry, and prose. Lecture and discussion in Spanish. Prerequisite: Span 30 or equivalent. (Spring)

56 **Topics in Hispanic Literatures and Cultures in Translation** (3) Hampton, Britt, Waisman
Dynamics of Hispanic societies and their cultures studied through literature, art, or film. Topics vary. Readings and lectures in English. The course may be repeated for credit. Laboratory fee may be required. (Fall and spring, alternate years)

90 **Textual Analysis** (3) Vergara and Staff
Methodology and vocabulary of literary criticism. Application of various principles of textual analysis and critical approaches to literature. Prerequisite: Span 30 or equivalent. (Fall and spring)

108 **Advanced Spanish Grammar and Style** (3) Echeverria, Serrano-Ripoll, Staff
Composition, drills, dictations. Translations into Spanish. Study of vocabulary and syntax, with emphasis on stylistic devices. Prerequisite: Span 10. (Fall and spring)

109 **Contemporary Spain and Latin America** (3) Echeverria and Staff
Emphasis on advanced oral work. Discussion of Hispanic culture and civilization, based on contemporary writings and video documents. Laboratory fee, $50. Prerequisite: Span 10. (Fall and spring)

110 **Business and Commercial Spanish** (3) Echeverria and Staff
Structure and language of Latin American and Spanish economic institutions. Discussion of legal, financial, and administrative documents. Oral and written reports. Prerequisite: Span 10. (Spring)

120 **Studies in Medieval Spanish Literature** (3) Azar
Reading and analysis of the major literary texts from the 11th through the 15th century. Attention paid to linguistic aspects of Old Spanish.

121 **Studies in Golden Age Literature** (3) Azar
Major texts of the 16th and 17th centuries. Topics may include lyric poetry and the "invention" of subjectivity; prose fiction; *comedia* and the relation between private and public life; humanism and the classical tradition; the invention of the press, the status of writing, and the new culture of the book; the (post)modernity of Golden Age literature.

122–23 **Cervantes' *Don Quijote* and the Rise of the Novel** (3) Azar
Issues raised in the text of *Don Quijote*: literature and life, words and deed, the fashioning of self, the structures of narrative, the limits and possibilities of representation, and the relation between appearance and reality, knowledge and understanding, fiction and truth. Cervantes' "invention" of the novel. Prerequisite to Span 123: Span 122 or approval of instructor. (Academic year)

124 **Reason, Superstition, and Literature in 18th-Century Spain** (3) Britt
The development of neoclassical aesthetics in Spain: the confrontation of reason and superstition; the autonomy of critical thought vis-à-vis the doctrines of the Catholic Church and the absolute powers of the monarchy; culture as state-sponsored spectacle; the split between elites and masses, high and low culture; the conjunction of "good taste" and pedagogy.

125 **The Myth of the Two Spains** (3) Britt
Literature as an expression of the institutionalization of liberalism in 19th-century Spain and of official and popular resistance to this modernizing credo. Topics may include the romanticism of Quintana, Espronceda, Blanco-White and Becquer; the *costumbrismo* of Castro and Larra; the realism of Galdós; and the naturalism of Pardo Bazán and Clarín.

126 **The Literature of Spain's First Century Without Empire** (3) Britt
Spain's imperial crisis and its persistence throughout the 20th century as a central theme in Spanish literary and intellectual culture. Topics may include decadence and regeneration; modern Spanish nationalism and cultural imperialism; Hispanicism and pan-nationalism; the Spanish Civil War, fascism and liberalism; the transition from fascism to democracy. (Fall)

130 **Poetry of Spain and Spanish America** (3) Vergara, Hampton, Azar
Study of poetic traditions and genres. Analysis of representative texts from the early modern to the contemporary periods. Authors may include: Garcilaso, Quevedo, Darío, Silva, Lorca, Neruda, Salinas, Jiménez, Gioconda Belli. (Spring)

131 **Topics in the Cinema of the Hispanic World** (3) Staff
Film as a language of cultural and historical testimony in Spanish America and Spain. Topics may include the Silent Era, Surrealism, the Mexican Golden Age of the '40s, the New Cinema of the '50s, Peronist cinema in Argentina, socialist film in Cuba, and postmodern production in the Hispanic world. May be repeated for credit. Laboratory fee, $30. (Fall)

132 **Theatre and the Hispanic Experience** (3) Azar, Britt, Captain
Theatrical representation: presence and performance, body, voice, dialogue, and the unfolding of conflict. Theatrical traditions and movements may include Golden Age drama; neo-Classical and Romantic drama of the 19th century; drama of political protest; existentialist drama and the theater of the avant-gardes. (Spring, alternate years)

133–34 **Special Topics in Spanish and Spanish-American Literature** (3–3) Staff
May be repeated for credit provided the topic differs.

140 **Latin American Women Writers** (3) Vergara
Works of well-established women writers (e.g., Sor Juana Inés de la Cruz, Gabriella Mistral, and Luisa Valenzuela) and of more recent writers (e.g., Elena Poniatowska, Diamela Eltit, Ana Lydia Vega, Cristina Peri-Rossi, and Laura Esquivel) discussed in relation to feminist principles of criticism. (Spring)

145 **Modern Spanish-American Poetry** (3) Vergara, Hampton, Waisman
Poetry after modernism; forms and themes that characterize the work of authors such as Agustini, Guillén, Huidobro, Lezama, Mistral, Neruda, and Palés. (Spring)

146 **Spanish-American Short Fiction** (3) Azar, Captain, Vergara, Waisman
Short prose narratives as agents of questioning textual meaning and subverting former literary traditions. Writers may include Arenas, Borges, Cortázar, Fuentes, García Márquez, Quiroga, Peri Rossi, Ana Lydia Vega, Zapata Olivella. (Fall)

147 **Spanish-American Polemics** (3) Britt, Captain, Waisman
Relations between state and nation in post-independence literary and political polemics of 19th century Spanish America. Topics may include the essay as a new genre for a new age; the figure of the public intellectual vis-à-vis the processes of state and nation formation; the post-colonial state and its imagined national, ethnic, racial, and economic communities. (Spring, alternate years)

148 **New Narrative in Spanish America** (3) Captain, Vergara, Waisman
Experimental fiction in Spanish America, with focus on literature of the mid-1960s through the present. Authors may include Alejo Carpentier, Julio Cortázar, Diamela Eltit, Carlos Fuentes, Cabrera Infante, Lezama Lima, García Márquez, Octavio Paz, Ricardo Piglia, Elena Poniatowska, Mario Vargas Llosa. (Fall)

149 **Spanish-American Colonial Literature** (3) Captain, Vergara
Analysis of chronicles, essays, memoirs, epistolary exchanges, and poetry contextualized vis-à-vis the medieval and Renaissance values of Imperial Spain. Authors may include Cabeza de Vaca, Bartolomé de las Casas, Colón, Cortés, Díaz del Castillo, El Inca Garcilaso de la Vega, Sor Juana Inés de la Cruz, Rodríguez Freile, Sepúlveda. (Spring)

150 **Spanish-American Romanticism and Modernism** (3) Captain, Vergara, Waisman
Study of two movements that shaped literary expression of Spanish America at the turn of the century and influenced political and cultural thought throughout the Hispanic world. Authors may include Heredia, Echeverría, Avellaneda, Isaacs, Darío, Martí, Lugones. (Fall, alternate years)

197 **Independent Study** (arr.) Staff
Admission by permission of department chair and instructor. May be repeated for credit.

199–200 **Proseminar** (3–3) Staff
Required of all majors; preparation for the major field examination. Literature in relation to the other arts and the social sciences. Span 199: textual analysis, literary criticism, theory, and methods. Span 200: the concepts of literary history and the history of Spanish literature; periods, authors, genres, topics. (Academic year)

ROMANCE LANGUAGES AND LITERATURES

55 **Topics in Romance Literatures and Cultures in Translation** (3) Staff
Topics and themes providing a multicultural and comparative approach to the study of the cultural productions of French, Italian, and Spanish-speaking people. Readings and lectures in English. May be repeated for credit provided the topic varies. A laboratory fee may be required. (Fall)

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

This interdisciplinary course is offered under the joint auspices of the departments in the School of Engineering and Applied Science.

1 **Engineering Orientation** (1) Tong, Heller
Introduction to careers in engineering and computer sciences, University resources, and computer skill development. Emphasizes teamwork skills by applying them to several design projects. (Fall)

SERVICE–LEARNING PROGRAM

154 **Independent Study** (1 to 3) Staff
Fieldwork and a complementary academic program of study, under the supervision of an appropriate faculty member. Students must contract with the agency, the faculty member, and the Service–Learning Program in Columbian College. Graded on a Pass/No Pass basis only. Admission by permission of CCAS. May be repeated to a maximum of 6 credits. (Fall and spring)

700 SERIES

The 700 Series is made up of experimental or special courses that are on the cutting edge of the academic endeavor. Often, courses in the 700 Series focus on interdisciplinary or very current issues in a field. Courses range from freshman-level offerings to classes designed for seniors and graduate students. Unless the course description in the *Schedule of Classes* indicates that there are prerequisites or that an interview with the instructor is required prior to registration, all interested students are eligible to register, subject to their advisor's approval and the rules of the respective schools. Because 700 Series courses change each semester, students should consult the *Schedule of Classes* for offerings. Courses are listed with the participating departments; course descriptions appear in a specially designated section of the Schedule.

Courses numbered 701 are in general studies, 721 courses are interdepartmental, 751 courses are interschool, and 770s and 780s are taught by University Professors and are listed in this Bulletin under the designation of University Professors. The program is coordinated by the Executive Director of Academic Planning and Assessment.

SIGN LANGUAGE

See **Speech and Hearing Science.**

SLAVIC LANGUAGES AND LITERATURES

See **German and Slavic Languages and Literatures.**

SOCIOLOGY

University Professor A. Etzioni
Professors W.J. Chambliss, J.L. Tropea, S.A. Tuch, R. Weitzer, R.J. Cottrol, G.D. Squires (*Chair*)
Associate Professors H. Nashman, C. Deitch, M.A.P. Saunders

Assistant Professors C.E. Kubrin, I. Kennelly, D.S. Eglitis, F. Buntman, R. Penney, P. Davidson, L. Torres
Adjunct Professor C. Hartman
Adjunct Associate Professors R.B. Zamoff, L. Joseph
Adjunct Assistant Professors J.F. Markey, P.A. Konwerski, M. Mashayekhi
Assistant Professorial Lecturers K. Mulvey, V. Sardi

Bachelor of Arts with a major in sociology—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Soc 1.
3. Required courses in the major—Soc 101, 102, 103, 104, 197, and five additional 100-level sociology courses including at least one course chosen from the 160s group and one course chosen from the 170s group. Soc 101 and 102 should be taken by the end of the junior year.

Bachelor of Arts with a major in criminal justice—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Soc 1.
3. Required courses in related areas—PAd 125 and two of the following course sequences: ForS 103–4, Econ 11 and 167, PSc 2 and 113 or 115.
4. Required courses in the major—Soc 3, 101, 102, 136, 145, 192, and one course chosen from Soc 135, 167, 178, 184, 189, 785, and Psyc 154. Soc 101 and 102 should be taken by the junior year.

Bachelor of Arts with a major in human services—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—Soc 1.
3. Required courses in related areas—Phil 135 and one course chosen from Comm 40, 41, 42, 120; 15 credit hours of 100-level courses in one other field of study, as approved by the major advisor.
4. Required courses in the major—HmSr 152, 171, 172, 176, 177, 182, 195; Soc 101, 104.

Five-Year Bachelor of Arts with a major in criminal justice and Master of Public Administration—Interested students should contact their advisor about this combined degree program early in their junior year.

Special Honors—In addition to meeting the general requirements stated under University Regulations, a candidate for graduation with Special Honors in sociology or criminal justice or human services must maintain a 3.3 grade-point average in required courses in the major, must be registered in Soc 195 or HmSr 193 by fall of their senior year, and must complete a senior honors thesis.

Minor in sociology—15 hours of course work are required, including Soc 1, one course selected from Soc 101 or 103 or 104, plus 9 hours of electives in sociology courses at the 100 level, excluding Soc 192 and 197.

Minor in criminal justice—18 hours of course work are required, including Soc 1, 3, 136, and 145, plus 6 hours of electives chosen from Soc 167, 178, 184; Psyc 154; ForS 103; PSc 113 or 115; and PAd 117.

Minor in human services—A minimum of 18 hours of course work, including HmSr 152 (6 hours), 176, 182, 195, and an elective (Soc 1 is recommended) chosen with permission of advisor.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Note: A student majoring in sociology may not declare a second major or a minor in criminal justice, nor vice versa.

Departmental prerequisite: Soc 1 is prerequisite to all 100-level sociology courses except Soc 105.

SOCIOLOGY

1 **Introduction to Sociology** (3) Staff
A broad overview of the "sociological imagination" as a way of understanding social events and personal experience; sociology's place among the social sciences; basic elements of sociological perspectives. (Fall and spring)

3 **Introduction to Criminal Justice** (3) Kubrin, Weitzer, Buntman
An introduction to the study of criminal justice. The historical development of criminal justice and its evolution into modern legal systems. The impact of different forms of criminal justice on society and the individual. (Fall)

101 **Social Research Methods** (3) Kubrin, Tuch, Davidson, Torres
Lecture (3 hours), laboratory (1 hour). Introduction to basic research methods in sociology. Topics include research design, sampling, measurement, and analysis of survey data via computer application. (Fall)

102 **Techniques of Data Analysis** (3) Kubrin, Tuch, Davidson
Continuation of Soc 101. Examination of a range of topics in the statistical analysis of sociological data, with a strong emphasis on computer applications. Prerequisite: Soc 101. (Spring)

103 **Classical Sociological Theory** (3) Kennelly, Eglitis
Development of social thought from 1840 to 1940. Major emphasis on Comte, Marx, Durkheim, Simmel, Weber, Martineau, DuBois, Addams, and Mead. (Fall)

104 **Contemporary Sociological Theory** (3) Kennelly, Eglitis
A systematic study of the work of selected social theories of the post–World War II era. Emphasis on Parsons, Merton, Mills, Giddens, Smith, Blumer, Goffman, Berger, Gramsci, Beauvoir, Wallerstein, Foucault, and Butler. (Spring)

105 **Social Problems in American Society** (3) Squires, Kubrin
Introduction to critical social problems (e.g., unemployment, poverty, crime, discrimination) in the United States and how they are, and have historically been, researched and understood by the academic and non-academic worlds. Concepts, theories, and methods of sociological research; examination of the field of social problems generally, emphasizing contemporary social problems.

111 **Qualitative Research** (3) Chambliss, Weitzer
Examination of the logic of qualitative inquiry and techniques of qualitative data collection and analysis. Various research methods are covered, with an emphasis on intensive interviewing, participant observation in field settings, and focus groups. (Spring)

112 **Evaluation Research** (3) Staff
Introduction to the evaluation of public programs designed to address the impact of social problems on individuals, households, and larger collective groups. Application of social science theory and research methods to the assessment of impact benefits and costs of such programs. (Fall)

135 **Youth and Delinquency** (3) Chambliss, Kubrin, Tropea
Analysis of historical, economic, and social conditions affecting both difficulties in socializing youth and the evolution of the state's formal systems of control. (Spring)

136 **Criminology** (3) Chambliss, Tropea, Weitzer
Nature and distribution of crime as related to the development and operation of criminal law and various social and legal institutions. Analysis of the historical, social, legal, and cultural conditions affecting the nature of crime, criminality, and the development of state responses made to it. (Spring)

145 **Introduction to Criminal Law** (3) Chambliss, Tropea, Buntman
Introduction to the sources and fundamental principles of criminal law and procedure using major sociological perspectives as interpretive tools. (Spring)

150 **Sociology of Sport** (3) Zamoff
Sport as a social institution; the role, consequences, and functions of sport in U.S. society. Relationships between sport and the institutions that impact our lives: education, mass media, economics, politics, etc.

151 **Jackie Robinson: Race, Sport, and the American Dream** (3) Zamoff
How Jackie Robinson's struggles and accomplishments can help in understanding current issues in race, sport, and U.S. society. The background leading to, and the impact emanating from, Robinson's entry into major league baseball.

161 **Sociology of Complex Organizations** (3) Tropea
Review of sociological approaches to the study of complex organizations. Selected and comparative emphasis on bureaucratic organization in both government and private sectors. (Spring)

162 **Sociology of the Family** (3) Staff
An examination of the stages of family life: birth, childhood, premarital relationships, marriage and sex roles in marriage, retirement and old age. Special emphasis on development and maintenance of interpersonal relations. (Fall)

163 **Sociology of Education** (3) Tropea
Analysis of educational systems from historical–comparative, institutional, and micro-sociological perspectives. Emphasis on educational systems in relation to the religious, cultural, economic, and political forces shaping their character; the role of formal education in modern society. (Spring)

165 **Sociology of Religion** (3) Yeide
Analysis of the relationships between religion and society. Topics include the contribution of religion to social integration, social change, and social inequality; the nature of religious experience; religious symbolism; the basis of religious communities. (Spring)

167 **Sociology of Law** (3) Chambliss, Tropea, Buntman
Law as a social phenomenon and agency of social control. Special emphasis is placed on study of the sources of and challenges to the legitimacy of law. (Fall)

168 **Economic Sociology** (3) Tropea
Sociological approach to the study of micro- and macroeconomic behavior. Historical and comparative analyses informed by the literature of sociology and other social sciences. Critical review of economic policy in developing, post-communist and advanced market societies. (Spring)

169 **Urban Sociology** (3) Squires, Davidson
Analysis of the city from a sociological perspective. Topics include a focus on the social change and inequality associated with urban growth, neighborhood change, and suburbanization; residential segregation; the issue of whether community exists in cities; urban poverty and homelessness. Prerequisite: Soc 1.

170 **Class and Inequality** (3) Tuch, Penney, Torres
Analysis of distribution of resources and opportunities for participation, education, and social mobility. International comparisons; analysis of public policies that affect these distributions. (Fall)

173 **Social Movements** (3) Penney
General survey of the various forms of collective behavior (fads, panics, riots, social movements, etc.), and a more detailed study of the genesis, development, and decay of social movements and social revolutions. (Spring)

175 **Sociology of Sex and Gender** (3) Kennelly, Eglitis, Torres
The roles of women and men from social structural and social psychological perspectives. Analysis of gender inequality in such areas as the family, the workforce, the media, politics, law, religion, and education.

178 **Deviance and Control** (3) Tropea, Weitzer, Kubrin
Examination of deviant behavior and its control. Topics include theoretical perspectives, changing societal conceptions of deviance, deviant behavior and identity, and the dynamics of control agencies. (Fall)

179 **Race and Minority Relations** (3) Tuch, Torres, Squires
Analysis of relationships between dominant and minority groups in society; nature and range of problems; analysis of the phenomenon of prejudice. (Spring)

181 **Special Topics in Sociology** (3) Staff
Analysis and examination of various processes in society of general importance to the field of sociology, e.g., social conflict, socialization, social change. Topic changes each semester; may be repeated once for credit. (Fall and spring)

182 **Sociology of Memory** (3) Staff
Commemorates major societal events (e.g., court cases, formation of organizations, publications) and examines their meanings for the contemporary culture of U.S. communities.

184 **Violence and the Family** (3) Tropea, Weitzer
Comparative approach to power and violence in family systems. Analysis of devaluation of family relations. Critical survey of explanations of violence and responses made to it. (Fall)

189 **Special Topics in Criminal Justice** (3) Staff
Analysis and examination of various processes and problems of general importance to the field of criminal justice. Topic changes each semester; may be repeated once for credit. (Fall and spring)

192 **Fieldwork in Criminal Justice** (9) Chambliss, Weitzer
Development of experience-based perspective on criminal justice through field placement in criminal justice agencies. Restricted to senior criminal justice majors; field placement required before registration. Weekly seminar meetings, presentations, journal, and a paper are required. Prerequisite: Soc 136 or 145. (Fall and spring)

195 **Research** (1 to 3) Staff
Independent study and special projects. Open only to selected undergraduates with promising academic records. Prerequisite: Students must submit a written proposal of their plan of study for the approval of the member of the department who will direct the research. May be repeated for credit to a maximum of 6 credits. (Fall, spring, and summer)

197 **Fieldwork in Sociology** (6) Tropea
Open to juniors and seniors majoring in sociology. Students spend at least 10 hours a week in an approved community agency or organization in metropolitan Washington. Field placement in consultation with a faculty member is required before registration. Weekly seminar meetings, reports, a journal, and a written paper are required. (Fall and spring)

HUMAN SERVICES

133 **Supervised Experience in Human Services** (3 to 6) Nashman
Development of experience-based perspective on human services through fieldwork in a community-based agency or organization. Meetings, journal, and research paper. Admission by permission of instructor. (Fall and spring)

152 **Issues in Human Services** (1 to 6) Nashman
An inquiry into the values and methods of practitioners in the field of human services, linking academic study and field experience. Admission by permission of instructor. (Fall and spring)

171 **Introduction to Human Development I** (3) Sardi
Lectures and fieldwork. All aspects of development through adolescence; child study techniques. Two to three hours weekly field experience in appropriate setting. (Fall)

172 **Introduction to Human Development II** (3) Staff
Adult development from young adulthood to old age. Dominant psychological, social, and physical competencies; motivational changes; coping styles; maladaptive behavior. Three hours weekly field experience in appropriate agency setting. (Spring)

176 **Program Planning and Development for Service Agencies** (3) Saunders
Examination of program planning and development activities essential to human service agencies. Through case studies and on-site field experiences, students examine and analyze a variety of processes in which agency needs are assessed and programs planned. Prerequisite: Status as a human services major or minor or permission of the instructor. (Fall)

177 **Human Services and Community: Empowerment for Social Change** (3) Konwerski
The community as a laboratory for the study of contemporary issues in philanthropy aimed toward social change. Through readings, observations, and group internships, students participate in various aspects of community service. (Fall)

182 **Organization and Administration in the Human Services** (3) Saunders
Introduction to organizational theory and program administration in non-school agencies, staff recruitment and development, fiscal operations, personnel and program supervision, facilities, and maintenance of effective community relations. Prerequisite: Status as a human services major or minor or permission of the instructor. (Spring)

193 **Research and Independent Study** (arr.) Nashman
Individual research and special projects. Admission by permission of instructor.

195 **Seminar in Human Services: Current Issues** (3) Konwerski
Analysis of selected issues in human services. Each student conducts an investigation of an identified problem in human services and completes a skill assessment project. Admission by permission of instructor. (Spring)

198 **Topics in Human Services** (1 to 3) Nashman
Topics to be announced in the *Schedule of Classes*. May be repeated for credit.

SPANISH

See **Romance Languages and Literatures.**

SPEECH AND HEARING SCIENCE

Professor C.W. Linebaugh
Associate Professors M.D.M. Brewer, G.M. Schulz (*Chair*), L. Bland-Stewart
Assistant Professors N.S. Richards, S. Brundage, J. Brown
Assistant Professorial Lecturers M.E. Moody, C. Robbins, D. Williamson

Bachelor of Arts with a major in speech and hearing science—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in related areas—Anth 4 or 161; Psyc 121 and 131 (or equivalents), plus 12 additional credit hours of 100-level courses selected from related areas as approved by the major advisor.
3. Required courses in the major—SpHr 11, 71, 72, 101, 102, 103, 104, 108, 119, 130, 131.

Minor in speech and hearing—15 credit hours are required, including SpHr 71, 101, 103, and at least 6 credit hours of 100-level courses to be selected from SpHr 102, 104, 108, 119, 130, and 131.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Speech and hearing therapy: See the Speech and Hearing Center.

11 **Voice and Diction** (3) Richards, Moody, and Staff
Development of naturalness, correctness, and clarity in conversation through the study of phonetics, rate, volume, pitch, and quality in preparation for performance. Laboratory fee, $10. (Fall, spring, and summer)

71 **Foundations of Human Communication** (3) Moody, Richards
An introduction to the fundamental principles of the biology of speech, hearing and language, language structure and use, and human communicative interaction. Practice in the identification of specific verbal and nonverbal aspects of communication behavior. (Fall and spring)

72 **Multicultural Issues in Human Communication** (3) Bland-Stewart
Consideration of the influences of culture and bilingualism on language development and use and on communicative interaction; experimental and ethnographic methods for studying language and communication in a multicultural society. (Fall and spring)

81–82 **Sign Language and Deafness I–II** (3–3) Robbins
SpHr 81: Development of basic communication skills, with appropriate vocabulary and grammatical structures; emphasis on comprehension skills. SpHr 82: Further development of communication competencies in American Sign Language (ASL) above the basic level. SpHr 81 is prerequisite to SpHr 82. (SpHr 81 and 82—fall and spring)

101 **Hearing Science** (3) Brewer
Anatomy and physiology of the auditory mechanism; basic acoustics and psychoacoustics. Theories of hearing and frequency and intensity perception. Laboratory fee, $20. (Fall)

102 **Neural Substrates of Speech, Hearing, and Language** (3) Schulz
Neuroanatomy and neurophysiology as they relate to speech, hearing, and language. Emphasis on sensory and motor systems and neuroanatomical correlates of language processing. Laboratory fee, $20. (Spring)

103 **Speech Science** (3) Staff
Functions of the respiratory, laryngeal, and orofacial structures in normal speech production; physiological and acoustic phonetics. Laboratory fee, $20. (Fall)

104 **Speech and Language Disorders** (3) Williamson
Survey of the nature and causes of developmental and acquired disorders of speech and language. Emphasis on prevention and effective communication with persons having a speech–language impairment. (Fall)

108 **Introduction to Audiology** (3) Brewer
Survey of the field of audiology, including the measurement of hearing, the nature and causes of hearing impairment, hearing aids and habilitation/rehabilitation of the hearing impaired. Prerequisite: SpHr 101. Laboratory fee, $20. (Spring)

119 **Analysis and Modification of Communication Disorders** (3) Staff
Assessment of speaker–listener behavior; acoustic, behavioral, and linguistic properties of speaker intelligibility and credibility; observation, analysis, and modification of speech and language comprehension and expression. Prerequisite: SpHr 71 or 104. Laboratory fee, $20. (Spring)

130 **Phonetics and Phonological Development** (3) Staff
Detailed study of English phonetics and phonology; prespeech vocalization and phonological development; multicultural issues in phonological development; intensive practice in phonetic transcription. Laboratory fee, $25. (Fall)

131 **Language Acquisition and Development** (3) Bland-Stewart
Theories of language acquisition; development of language from birth through adolescence; emphasis on development of semantics, syntax, morphology, and pragmatics; multicultural issues in language development. Laboratory fee, $25. (Spring)

196 **Independent Study** (1 to 6) Staff
Independent research and special projects. Before students are permitted to register for SpHr 196, they must submit a written proposal of the plan of study and obtain approval of the staff member who will direct the study and of the department chair.

199 **Selected Topics** (3) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

STATISTICS

Professors J.L. Gastwirth, N.D. Singpurwalla, J.M. Lachin III, H.M. Mahmoud, T.K. Nayak (*Chair*), Z. Li, J. Chandra (*Research*), R.L. Launer (*Research*)
Associate Professors S. Bose, R. Modarres, E. Bura
Assistant Professors C. Tatsuoka, K. Ghosh, S. Kundu, S. Balaji, Y. Lai
Professorial Lecturers F. Ponti, P. Chandhok, J. Wu
Associate Professorial Lecturers R.F. Teitel, C.M. Fleming
Lecturer H. Modarres

Bachelor of Science with a major in statistics—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite courses—Math 31, 32, 33; Stat 91 or another first course in statistical methods.
3. Required courses in the major—Math 124; Stat 118, 119, 129, 157–58, and one from 130, 183, or 197, plus three approved 100-level courses, some of which, in special circumstances, may be taken in other departments. To assure a balanced program, departmental approval of electives is required for all majors.

Students who seek Special Honors in statistics should check with the Department.

Minor in statistics—18 hours of approved courses in this department, including an introductory statistics course, Stat 118 or 123, and one computer-intensive course.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Note: Stat 51, 53, 91, 104, 111, and 127 are related in their subject matter, and credit for only one of the six may be applied toward a degree. One entrance unit in algebra is prerequisite to all courses in statistics.

51 **Introduction to Business and Economic Statistics** (3) Nayak and Staff
Lecture (3 hours), laboratory (1 hour). Frequency distributions, descriptive measures, probability, probability distributions, sampling, estimation, tests of hypotheses, regression and correlation, with applications to business. (Fall and spring)

53 **Introduction to Statistics in Social Science** (3) Tatsuoka, Balaji
Lecture (3 hours), laboratory (1 hour). Frequency distributions, descriptive measures, probability, sampling, estimation, tests of hypotheses, regression and correlation, with applications to social sciences. (Fall and spring)

91 **Principles of Statistical Methods** (3) Ghosh
Probability, frequency distributions and their characteristics, descriptive measures, estimation, tests of hypotheses, regression and correlation. Primarily for students in the natural sciences. (Fall)

103 **Sampling in Accounting** (3) Ponti
Special emphasis on applications of sampling techniques and design to accounting problems. Prerequisite: Stat 51, 53, 91, or equivalent. (Fall)

104 **Statistics in Management, Administration, and Policy Studies** (3) Staff
Lecture (3 hours), laboratory (1 hour). Introductory study of statistical techniques for research problems. For graduate students in fields other than statistics who have no previous statistics training. Offered off campus only.

105 **Statistics in the Behavioral Sciences** (3) Ponti
Lecture (3 hours), laboratory (1 hour). Advanced study of statistical techniques for research problems. Analysis of variance, correlation techniques, nonparametric techniques, sampling theory. Prerequisite: an introductory statistics course and satisfactory performance on a placement examination. (Fall and spring)

111 **Business and Economic Statistics I** (3) Gastwirth, Bura
Descriptive statistics, graphical methods, probability, special distributions, random variables, sampling, estimation and confidence intervals, hypothesis testing, correlation and regression. (Fall)

112 **Business and Economic Statistics II** (3) Gastwirth, Bura, Kundu
Continuation of Stat 111, with emphasis on techniques of regression, chi-square, sampling designs, index numbers, time series, decision analysis, and other topics used in economics and business. Prerequisite: Stat 111 or equivalent. (Fall and spring)

118 **Regression Analysis** (3) Bura, Kundu
Lecture (3 hours), laboratory (1 hour). Simple and multiple linear regression, partial correlation, residual analysis, stepwise model building, multicollinearity and diagnostic methods, indicator variables. Prerequisite: an introductory statistics course. (Fall and spring)

119 **Analysis of Variance** (3) Tatsuoka
Lecture (3 hours), laboratory (1 hour). Introduction to the design of experiments and analysis of variance; randomized block, factorial, Latin square designs, and analysis of covariance. Prerequisite: Stat 118. (Spring)

123 **Introduction to Econometrics** (3) Staff
Same as Econ 123.

127 **Statistics for the Biological Sciences** (3) Staff
Introduction to statistical techniques and reasoning applicable to the biomedical and related sciences. Properties of basic probability functions: binomial, Poisson, and normal. Data analysis, inference, and experimental design. (Spring)

129 **Introduction to Computing** (3) Mahmoud, Modarres, Teitel
Introduction to elements of computer programming and problem-solving using Pascal. Hands-on experience will be acquired through computer programming projects, including some simple statistical applications. (Fall and spring)

130 **Computer Programming** (3) Staff
Development of advanced computing ideas: records, recursion, sets, pointer variables and dynamic storage. Introduction to data structures: stacks, queues, linked lists, and binary search trees. Prerequisite: Stat 129 or equivalent. (Spring)

157–58 **Introduction to Mathematical Statistics** (3–3) Bose, Mahmoud
Stat 157: Basic concepts of probability theory, including random variables, independence, distribution theory, and sampling theory. Stat 158: Inference procedures, including estimation, hypothesis testing, regression analysis, and experimental design. Prerequisite: Math 32 or equivalent. (Academic year)

173 **Discrete Systems Simulation** (3) Staff
Same as EMSE 173.

181 **Applied Time Series Analysis** (3) Wu
Autoregressive integrated moving average (ARIMA) modeling and forecasting of univariate time series. Estimation of spectral density functions, white noise tests, and tests for periodicities. Theory and applications using SAS. Prerequisite: Math 33, Stat 157–58 or 118. (Spring)

183 **Intermediate Statistical Laboratory: Statistical Computing Packages** (3) Modarres
Application of program packages (e.g., SAS, SPSS) to the solution of one-, two- and k-sample parametric and nonparametric statistical problems. Basic concepts in data preparation, modification, analysis and interpretation of results. Prerequisite: an introductory statistics course. (Fall and spring)

187 **Introduction to Sampling** (3) Staff
Problems of sampling and sample design. Prerequisite: Stat 91 or equivalent. (Fall)

188 **Nonparametric Statistical Inference** (3) Staff
Statistical inference when the form of the underlying distribution is not fully specified. Nonparametric procedures for estimation and testing hypotheses. An introduction to robust procedures. Prerequisite: Stat 91 or equivalent. (Fall, even years)

189–90 **Mathematical Probability and Applications** (3–3) Mahmoud
Probability theory, including combinatorial analysis, conditional probability, and stochastic independence. Random variables and their distributions; laws of large numbers and central limit theorem. Application of concepts to elementary stochastic processes (coin-tossing sequences, branching processes, Markov chains). Prerequisite: Math 32 or equivalent. (Alternate academic years)

195 **Reading and Research** (arr.) Staff
May be repeated once for credit. Admission by permission of department chair. (Fall and spring)

197 **Fundamentals of SAS Programming for Data Management** (3) Modarres, Teitel
Fundamentals of the SAS system for data management, statistical analysis, and report writing. Data modification; programming; file handling; and macro writing. Prerequisite: An introductory statistics course and Stat 129. (Spring)

198 **Special Topics** (3) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the content differs.

STRATEGIC MANAGEMENT AND PUBLIC POLICY

Professors H.J. Davis, W.H. Becker, D.J. Lenn
Associate Professors J.B. Thurman (*Chair*), J. Cook, E.J. Englander, J.H. Beales III, M. Starik, L. Burke, J. Griffin, B.S. Teng
Assistant Professors D.R. Kane, J.W. Geranios, J. Rivera
Professorial Lecturer W.N. LaForge

See the School of Business for programs of study leading to the degree of Bachelor of Business Administration.

51 **Introduction to Business** (3) Staff
Structure, activities, and problems of business enterprise; its contribution to the individual and society; careers in business. Prerequisite: Sophomore standing. (Fall)

104 **Business Law: Regulatory Environment of Business** (3) Staff
Same as Accy 153.

105 **Business Law: Contract, Torts, and Property** (3) Staff
Same as Accy 151.

106 **Business Law: Enterprise Organization** (3) Staff
Same as Accy 152.

190 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods.

199 **Independent Study** (arr.) Staff
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall and spring)

THEATRE AND DANCE

Professors M.R. Withers, A.G. Wade, L.B. Jacobson (*Chair*), N.C. Garner
Associate Professors W.A. Pucilowsky, C.F. Gudenius, E.J. O'Brien
Assistant Professors B.W. Sabelli, M.A. Buckley, F. Minwalla, D. Burgess

Bachelor of Arts with a major in theatre—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in related areas—9 credit hours in dramatic literature and playwriting at the 100 level.
3. Required courses in the major—TrDa 14, 124, 130, 139 (3 credits), 145–46, 147; 6 credit hours in design/technical theatre courses; 12 additional credit hours in 100-level theatre and dance courses.

Bachelor of Arts with a major in dance—The following requirements must be fulfilled:
1. The general requirements stated under Columbian College of Arts and Sciences.
2. Required courses in the major: 13 credit hours of courses in technique; 17 hours of courses in creative process/performance; 3 hours of production design; 6 hours of electives. The department maintains a list of courses that fulfill these requirements.

Bachelor of Arts with a major in dramatic literature—The Department of Theatre and Dance and the Department of English offer an interdisciplinary major in dramatic literature. See Dramatic Literature.

Minor in Theatre—18 credit hours of theatre courses, including TrDa 145–46.
Minor in Dance—18 credit hours of dance courses, including no more than 9 hours from TrDa 49 through 59 and 160 through 175, plus 3 hours from TrDa 180, 182–83, 185, 186, and 191.

Special Honors—In addition to meeting the general requirements stated under University Regulations, candidates for graduation with Special Honors in Theatre or Dance must have a grade-point average of 3.4 in the major and complete TrDa 199 with a grade of *A*. They must consult with a faculty advisor at the beginning of the second semester of the junior year to determine eligibility, area of study, and the director of the research or creative project.

With permission, a limited number of graduate courses in the department may be taken for credit toward an undergraduate degree. See the Graduate Programs Bulletin for course listings.

Note: Courses below the 100 level are primarily for nonmajors.

11 **Theatre Production** (3) Sabelli
Understanding of the basic elements of production (performance, technical and management) and the collaborative artist/artisan process through discussion, observation, and practical application. (Fall and spring)

14 **Introduction to Acting** (3) Garner, Jacobson, Wade
Basic techniques of concentration, imagination, improvisation, and character development. (Fall and spring)

45 **Understanding the Theatre** (3) Sabelli
The art of the theatre; its literature, architecture, aesthetics, and mechanics. Contributions of the playwright, actor, director, and designer. Attendance at theatrical performances, presentations, and videos. (Fall and spring)

46 **Understanding the Dance** (3) Staff
The art of dance—a lecture and experiential approach to its cultural importance, history, and creative processes. The contributions of the choreographer and dancer to society. Attendance at performances, presentations, and video. (Fall and spring)

49 **Movement Awareness** (2) Staff
An experiential dance movement class that examines human movement and its connection to dance. Somatic concepts of Alexander, Feldenkrais, Bartenieff, and Body/Mind/Centering. May be repeated for credit. (Fall and spring)

50 **Beginning Ballet** (1) Staff
Introduction to classical ballet technique, including basic concepts of dynamic alignment, stretch, strength, and musicality.

51 **Beginning/Intermediate Ballet** (1) Staff

52 **Beginning Modern/Postmodern Dance** (1) Staff
Introduction to modern dance technique inclusive of basic concepts of dynamic alignment, stretch, strength, improvisation and musicality.

53 **Beginning/Intermediate Modern/Postmodern Dance** (1) Staff

58 **Beginning Spanish Dance** (1) Staff
Introduction to the art form of classical Spanish dance, including basic movement rhythms and polyrhythmic uses of the feet, hands, arms, and castanets.

59 **Beginning/Intermediate Spanish Dance** (1) Staff

105 **Fundamentals of Playwriting** (3) Griffith
Same as Engl 105.

108 **Intermediate Playwriting** (3) Griffith
Same as Engl 108.

115 **Introduction to Scene Study: Realism** (3) Garner, Jacobson, Wade
Principles of role development, concentrating on 20th-century material. Prerequisite: TrDa 14. (Fall and spring)

116 **Scene Study: Voice and Character** (3) Jacobson
The practice and application of voice production with reference to skeletal alignment, breathing, resonance, and articulation. Emphasis on the process of voice production and its application to performance through work on scenes and monologues. Prerequisite: TrDa 115. (Fall and spring)

120 **Scene Study: Postrealism** (3) Wade
The actor's approach to the presentational aesthetics in the work of modern and contemporary dramatists. Prerequisite: TrDa 116. (Spring, even years)

121 **Scene Study: Contemporary Comedy** (3) Garner, Jacobson
Principles of role development, comic timing, and stage business, concentrating on material by contemporary playwrights, such as Neil Simon. Prerequisite: TrDa 116. (Fall, odd years)

122 **Scene Study: Shakespeare** (3) Wade
Principles of role development and handling of verse dialogue in Shakespearian drama. Prerequisite: TrDa 116. (Fall, odd years)

123 **Scene Study: Classical Comedy** (3) Jacobson, Garner
Principles of role development, concentrating on material from the English Restoration, Molière, and other 17th- and 18th-century playwrights. Prerequisite: TrDa 116. (Spring, even years)

124 **Play Analysis** (3) Minwalla
Same as Engl 124.

125 **Stage Dialectics** (3) Jacobson
Vocal production related to interpretation of specific texts. Focus on stage dialects and the interpretation of Shakespeare. Prerequisite: TrDa 116. (Spring, odd years)

127 **Scene Study: Film and Television** (3) Wade
Techniques of acting for the camera; analysis of film and television scripts from actor's point of view. Prerequisite: TrDa 116. Laboratory required. Laboratory fee, $10. (Spring)

128 **Audition Techniques** (3) Garner
All aspects of the audition process: selection and rehearsal of audition monologues, handling of cold reading, etc. Prerequisite: TrDa 116. (Fall)

130 **Basics of Production Design** (3) Sabelli, Pucilowsky, Gudenius
Understanding of the basic elements of production design and execution through discussion, observation, and practical application. Laboratory required. Laboratory fee, $50. (Fall and spring)

131 **Introduction to Lighting** (3) Gudenius
Lecture (2 hours), laboratory (1 hour). Theories and practicum in lighting for theatre and dance. Laboratory fee, $15. Prerequisite: TrDa 130. (Fall)

132 **Makeup Design** (3) Pucilowsky
Theory and practicum in the art of makeup design, including latex and crepe hair. Prerequisite: TrDa 130. (Fall)

135 **Introduction to Scene Design** (3) Sabelli
Fundamental study of scenography, including historic overview, basic drawing, and rendering techniques, through the use of various mediums and script analysis. Prerequisite: TrDa 130. (Fall, odd years)

136 **Beginning Costuming** (3) Pucilowsky
History of fashion in Western civilization from ancient Greece to the 20th century. Fundamental study of costume research through specific projects. Costume construction. Prerequisite: TrDa 130. (Spring)

139 **Theatre Practicum** (1) Gudenius
Participation in department mainstage productions in a production or management capacity under the supervision of a member of the faculty. Prerequisite: TrDa 11 or 130. May be repeated for credit. After completing for 3 credits, students may participate in a performance capacity for an additional 3 credits. Prerequisite: TrDa 11 or 130. (Fall and spring)

140 **Anthropology in Performance** (3) Garner, Allen
Exploration of the relationships among social interaction, ritual, and dramatic performance. Classes consist of improvisation workshops and discussion, based on readings about non-Western cultures. Same as Anth 191. (Spring)

145–46 **History of the Theatre** (3–3) Minwalla
A dramaturg's approach to case studies of theatre in historical context. TrDa 145: Ancient Greece through the 17th century. TrDa 146: the 18th, 19th, and 20th centuries. (Academic year)

147 **Directing for the Theatre** (3) Garner
Fundamentals of script analysis, casting, and rehearsal techniques. Prerequisite: TrDa 14, 124, 130. Laboratory fee, $15. (Fall and spring)

156 **Dance in Community Settings** (3) Burgess
Examination of dance in Washington area communities. Students are required to site visit and dialogue with individuals and organizations that focus on dance as it pertains to performance, therapy, and education. Participation in activities with a dance artist/practitioner or with a producing/service organization is required. (Spring)

160–61 **Intermediate Ballet** (2–2) Staff
May be repeated for credit. Prerequisite: TrDa 51 or equivalent.

162–63 **Intermediate/Advanced Ballet** (2–2) Staff
May be repeated for credit. Prerequisite: TrDa 160 or 161 or equivalent.

164–65 **Advanced Ballet** (2–2) Staff
May be repeated for credit. Prerequisite: TrDa 162 or 163 or equivalent.

170–71 **Intermediate Modern/Postmodern Dance** (2–2) Burgess
Recommended for students with previous dance experience in jazz, ballet, hip hop, modern, or other styles. Participation in production and/or management for dance required. May be repeated for credit. Prerequisite or corequisite: TrDa 49 or equivalent. (Fall and spring)

172–73 **Intermediate/Advanced Modern/Postmodern Dance** (2–2) Staff
May be repeated for credit. Prerequisite: TrDa 170 or 171 or equivalent.

174–75 **Advanced Modern/Postmodern Dance** (2–2) Staff
May be repeated for credit. Prerequisite: TrDa 172 or 173 or equivalent.

180 **Movement Improvisation and Performance** (3) Withers
Exploring the body and its surroundings in movement, use of language, narrative, environments and contexts for creative expression, developing event and performance structures from improvisation. May be repeated for credit. (Spring)

182–83 **Dance Composition** (3–3) Withers
TrDa 182: Problems in structural and conceptual aspects of constructing dances and shaping and forming movement materials. TrDa 183: Emphasis on intention and content in making dances. TrDa 180 and 185 recommended. (Academic year)

184 **Choreographic Projects** (3) Withers
Create a dance or a performance work of individual design, including casting, rehearsal procedures, staging aspects, and public presentation. Prerequisite: TrDa 130, 180, 182; recommended: TrDa 185, 192. May be repeated for credit.

185 **Trends in Performance Art** (3) Withers
Study of the theory and practice of contemporary performance art movements and artists; political and artistic activism; scripting and scoring to create performance works based on a single art discipline or interdisciplinary arts. Dance and technology in performance. (Fall)

186 **Movement Analysis** (3) Burgess
An experiential and theoretical approach to dynamic anatomy and kinesiology as they pertain to the dancer. The student is encouraged to reach full movement

potential in relation to contemporary dance techniques, performance, injury prevention, and general health. (Fall)

191 **Dance History** (3) Buckley
The history of Western theatrical dance from the late 18th century to the present. The major choreographers and their dance works through readings, lectures, video, and discussion. (Spring)

192 **Repertory/Performance** (1 or 2) Withers
Participation in the processes of learning and performing dance repertory or new dance works. Audition required. Laboratory required. May be repeated for credit. (Fall and spring)

193–94 **Dance Styles** (arr.) Staff
Forms of theatrical dance other than ballet or modern, including contact improvisation, African dance, Angola Capoeira, classical Indian dance, musical theatre, dances of the Islamic world, Korean dance, and others. Course topic varies. (Academic year)

195 **Selected Topics** (1 to 3) Staff
Topics of current interest in theatre or dance. Topics announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

196 **Independent Study** (1 to 6) Staff
Independent research and special projects. Open to qualified juniors or seniors majoring or minoring in theatre or dance. Before students are permitted to register for TrDa 196, they must submit a written proposal of the plan of study and obtain approval of the faculty member who is directing the study and the department chair.

198 **Internship** (3 or 6) Staff
Open to qualified seniors majoring or minoring in theatre or dance. Work placements with not-for-profit and commercial theatre and dance organizations for an approved number of hours per week. Admission requires departmental approval. May be taken for a maximum of 6 hours. (Fall and spring)

199 **Honors Thesis** (3) Staff
Directed research and/or creative project. Open to qualified seniors by permission. Arrangements must be made with a sponsoring faculty member in the department and applications must be completed early in the second semester of the junior year. (Fall and spring)

TOURISM AND HOSPITALITY MANAGEMENT

Professors D.E. Hawkins, D. Frechtling
Associate Professors L. Yu (*Chair*), L.A. Delpy Neirotti, S. Spivack, M.V. Smith
Assistant Professors T.W. Hilliard, R. Brouard
Professorial Lecturer W.C. Corkern
Assistant Professorial Lecturer E. Zavian
Lecturer H.E. Reichbart

See the School of Business for programs of study leading to the degree of Bachelor of Business Administration and the five-year program leading to the Bachelor of Business Administration and Master of Tourism Administration.

104 **Introduction to Tourism and Hospitality Management** (3) Staff
Historical overview and survey of the tourism and hospitality industry, with emphasis on the travel market, delivery of hospitality services, professional roles, and emerging trends. (Fall and spring)

113–14 **Practicum** (3–3) Staff
Fieldwork, internship, and/or instructional practice, including conference and/or seminar. Admission by permission of instructor. May be repeated once for credit with permission of advisor. (Fall, spring, and summer)

135 **Sport and Event Business Enterprises** (3) Delpy Neirotti
An overview of business opportunities related to sport and events. Emphasis on sport and event facilities and event management; product manufacturing, merchandising, and licensing; media and publications; and athlete representation. (Fall)

136 **Sport and Event Marketing** (3) Delpy Neirotti
Application of marketing theories and practices to sport and events. Sponsorship, endorsement proposals, public relations, and promotional campaigns. Prerequisite: BAdm 110. (Spring)

137 **Issues in Sport and Event Management** (3) Delpy Neirotti
A discussion of policies, procedures, organizational structures, issues, and trends in sport and events, from amateur to professional. (Spring)

143 **Hospitality Industry Management** (3) Staff
An overview of the basic principles and practices involved in the management, operation, marketing, and financing of hotels, restaurants, and other hospitality goods and services. (Fall)

144 **Financial Management in the Tourism and Hospitality Industry** (3) Yu
Basic principles of planning and managing tourism resources, developments, and facilities in relation to investment constraints and opportunities. Financial monitoring and control of hospitality facilities and related leisure services. Prerequisite: BAdm 115. (Spring)

145 **Travel Marketing Communications** (3) Spivack
Review of basic advertising, public relations, and sales techniques, applied to the tourism and hospitality industry. Current practices and case studies. (Spring)

147 **Passenger Transportation Systems** (3) Staff
Survey of passenger transportation modes. Emphasis on airline operations, marketing communications, and distribution channels. (Fall)

172 **International Experiences** (1 to 6) Delpy Neirotti
Travel to a foreign country for study of a specific topic. May be repeated for credit with permission of the advisor. (Fall, spring, and summer)

190 **Special Topics** (1 to 3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit. (Fall, spring, and summer)

199 **Independent Study** (1 to 3) Staff
Assigned topics. Admission by prior permission of advisor. May be repeated once for credit. (Fall, spring, and summer)

UNIVERSITY PROFESSORS

University Professors A. Etzioni, P.J. Caws, S.H. Nasr, K.F. Schaffner, J.N. Rosenau

Courses numbered in the 770s and 780s are taught by distinguished scholars who hold appointments as University Professors. With the approval of the department or program concerned, appropriate University Professor courses may be taken to satisfy degree program requirements. Permission of the University Professor may be required for enrollment. A complete listing of courses offered each semester appears in the *Schedule of Classes* under the 700 series. Following is a list of courses that are expected to be taught fairly regularly by University Professors.

IAff/PSc

770 **Turbulence in World Politics** (3) Rosenau
An effort to probe the sources and dynamics of change and continuity in local, national, and international affairs. The links between the orientations of individuals and the actions of collectivities are a major focus, along with the foundations of authority under transformative conditions. For graduate students; open to upper-level undergraduates.

IAff/PSc

771 **Political Aggregation** (3) Rosenau
An exploration of how collective action is fashioned out of the input of individuals, how collectivities become larger than the sum of their parts, and how political organizations manage to persist through time. Socialization, mobilization, momentum, and bandwagon effects are among the concepts evaluated. For graduate students; open to upper-level undergraduates.

IAff/PSc

772 **The Dynamics of Globalization** (3) Rosenau
An inquiry into the economic, cultural, and political processes through which individual and community life is expanding as awareness encompasses factors on a global scale. The consequences of this expansion at both global and local levels is examined, along with the possibility that these levels interact. For graduate students; open to upper-level undergraduates.

IAff/PSc

773 **Global Governance** (3) Rosenau
An inquiry into the prospects for and problems of governance on a global scale in the era following the end of the Cold War. Informal forms of governance as well as those that have undergone institutionalization are assessed. For graduate students; open to upper-level undergraduates.

Phil

772 **Individualism** (3) Caws
The concept of the free individual in philosophy, psychology, literature, and politics: individuals and groups; individualism and collectivism; exemplary individuals in biography, autobiography, and fiction; problems of individual and collective agency and identity. For undergraduates; open to graduate students.

Phil

774 **Understanding Technology** (3) Caws
The idea of technology—its relation to the sciences and the arts and humanities, its development, and its problems. Technology will not be regarded as merely dependent on the sciences or as merely useful (or dangerous) but as a human activity in its own right, with its own history, conceptual structure, interests, risks, and benefits. For undergraduates; open to graduate students.

Phil

778 **Left and Right in Philosophy and Politics** (3) Caws
A fundamental inquiry into the concept of the state in terms of entrenched oppositions: individualism/collectivism, equality/liberty, liberalism/conservatism, socialism/free enterprise, communism/capitalism. Emphasis on the present need to find a constructive transcendence of these oppositions. For graduate students; open to undergraduates.

Phil

779 **Philosophy and Psychoanalysis** (3) Caws
An exploration of some striking parallels between the topics addressed by Freud's psychoanalytic theories on the one hand and the traditional content of philosophical reflection on the other, with special emphasis on the relation between cognitive theory and therapeutic practice (in both disciplines). For graduate students; open to undergraduates.

HCS/Phil

770 **Philosophy of Medicine** (3) Schaffner
An introduction to philosophical issues in medicine, including scientific progress, the doctor–patient relationship, whether diseases are objective or socially conditioned entities, clinical reasoning using some simple examples from medical diagnosis and new drug testing, and ethical and social issues raised by the AIDS epidemic. For undergraduates; open to graduate students.

Phil

771 **Philosophy of Biology** (3) Schaffner
An introduction to philosophical issues in biology, including evolutionary biology, molecular biology and reductionism, teleology, experimental objectivity, philosophical implications of the neurosciences, sociobiology, and evolutionary ethics. For undergraduates; open to graduate students.

HCS/Phil

775 **Ethics and Health Policy** (3) Schaffner
The problem of health care reform and ethical issues associated with managed care and competition, Medicare and Medicaid reform, and the issue of health care rationing. Issues relating to the "right to die," including active and passive euthanasia and physician-assisted suicide. For graduate students; open to undergraduates.

HCS/Phil

777 **The Human Genome Project: Ethical, Legal, and Social Implications** (3) Schaffner
Ethical, legal, and social implications of the decoding of the entire human genome, including confidentiality of genetic information, genetic discrimination and insurance, reductionistic/deterministic implications, forensic issues, research ethics, gene therapy and patenting, and cloning. For graduate and medical students; open to undergraduates.

HCS/Phil

780 **Neurobiology and Reductionism** (3) Schaffner
Recent developments in neuroscience and theories of consciousness, including neural networks; philosophical implications, including the relations among genetics, brains, and behavior. For graduate students; open to qualified undergraduates.

Rel

770 **Islamic Civilization and the West** (3) Nasr
The encounter of Islam and the West, from the rise of Islam to modern times. Investigation of the impact of Islam on European philosophy, science, art, and literature; influence of the West and Western scholarship on the Islamic world. For juniors and seniors; open to graduate students.

Rel

771 **Persian Sufi Literature in East and West** (3) Nasr
The writings of major Persian Sufi poets and writers, such as Khayyam, Attar, Rumi, Shabistari, and Hafiz, and their impact on the West and on India. The translation of these works into European languages and their influence upon such figures as Goethe and Emerson are discussed. Assigned readings in English. For undergraduates; open to graduate students.

Rel

772 **Mysticism—East and West** (3) Nasr
A thematic examination of mystical traditions: the nature of mysticism, the search for ultimate reality, the mystical significance of the cosmos, the mystical science of the soul, and the significance of sacred art and symbols. Major mystical traditions of East and West—Hinduism, Taoism, Buddhism, Judaism, Christianity, Islam. For undergraduates; open to graduate students.

Rel

773 **Perennial Philosophy** (3) Nasr
The idea of perennial philosophy as developed in the 20th century by A. Huxley, A.C. Coomaraswamy, and others. Doctrines and teachings of perennial philosophy as found in various religious and philosophical traditions of East and West. Prerequisite: at least one course in religion, philosophy, or intellectual history. For undergraduates; open to graduate students.

Rel

775 **Man and the Natural Environment** (3) Nasr
The religious, philosophical, and scientific causes of the present environmental crisis. The history of religious and philosophical attitudes toward nature in the West, in the history of Western science, and in some non-Western world views that may encourage a more harmonious relationship between man and the natural environment. For undergraduates; open to graduate students.

Rel

777 **Religion and Science** (3) Nasr
The interaction between religion and science in ancient Egypt, classical Greece, Islam, India, China, and the West, from the Renaissance, the scientific revolution, and up to the present day. Key concepts and issues in the encounter of religion and science in light of the cultural matrix of the civilization and period in question. For juniors and seniors; open to graduate students.

Soc

776 **Public Policy Research** (3) Etzioni
Basic concepts of policy research in comparison to basic and applied research. Policy research methods. The social structure of policy research: producers and consumers of knowledge and issues arising among them. Open to undergraduates and graduate students with permission of the instructor. Prerequisite: social science or public policy course work or related experience.

PSc/Soc

777 **Contemporary American Society** (3) Etzioni
A social science perspective of contemporary American society. Analysis of concepts that allow continued insight into America's condition and future. Institutions examined include the family, schools, communities, the polity, and relations among racial/ethnic groups. For graduate students; open to undergraduates.

Soc/Econ/PSc

779 **The Elements of Socioeconomics** (3) Etzioni
A synthesized approach to the study of economic behavior and economic policy, drawing on relevant segments of economics and sociology as well as political science and psychology. A discussion of ethical assumptions and core concepts in the study of micro- and macroeconomic behavior and their policy implications. For graduate students; open to qualified undergraduates.

Soc/PSc/IAff

781 **Elements of Communitarian Thinking** (3) Etzioni
An examination of the roots of communitarian thinking in earlier philosophical work, current political theory, and historical and contemporary sociology. The relevance of communitarian thinking to various community-building social movements. For graduate students; open to undergraduates with permission of instructor.

Soc/PSc/IAff

782 **Elements of Public Policy in Communitarian Perspective** (3) Etzioni
The issues that arise when communities seeking to advance their goals run into commitments to individual and minority rights. Freedom of speech and hate codes, public safety and protection against search and seizure, majority votes and minority rights, and other policy issues. For graduate students; open to undergraduates with permission of instructor.

Soc

785 **The U.S. System of Criminal Justice** (3) Saltzburg
For undergraduates with an interest in law, social justice, and the politics of crime prevention. A rule-oriented view of the adversarial process and key players in the U.S. criminal justice system, including police authority and its limits, the privilege against self-incrimination, and roles of the judge and jury.

UNIVERSITY WRITING

Professor M. Knight (*Executive Director*)
Assistant Professors A. Chernock, R. Claycomb, E. Drown, C. Gamber, G. Guerra, C. Hayes, R. Jerving, R. Kristensen, M. Mullen, R. Riedner, P. Ryder, H. Schell, D. Thomas, P. Troutman, A. Wilkerson, R. Zeff, C. Zink

The University Writing Program provides comprehensive writing instruction. All undergraduates who enter GW as first-year students take UW 20, followed by two Writing in the Disciplines courses. These courses are designed to enable students to learn conventions of thinking and writing, methods of scholarship, and modes of communication of particular bodies of knowledge. Students are expected to write frequently and intensively, with significant editing and rewriting, sometimes for different audiences and different purposes, and often in collaboration with peers and faculty. Courses indicated with "W" in the *Schedule of Classes* fulfill the Writing in the Disciplines portion of University Writing Program requirements.

20 **University Writing** (4)
University-level, independent research and writing. Learning to frame research questions, identify and analyze supportive and contradictory evidence, employ a variety of research methods, and use the ideas of other writers appropriately. Developing strategies to draft and revise clear, engaging prose for a variety of purposes and audiences. Thematically oriented seminars; texts and course topics vary among instructors. (Fall and spring)

VIETNAMESE

See **East Asian Languages and Literatures.**

WOMEN'S LEADERSHIP PROGRAMS

Director R.S. Heller

The courses listed below are restricted to students who participate in the Elizabeth J. Somers Women's Leadership Programs on the Mount Vernon Campus.

101–2 **Women and Leadership** (3–3)
Women's status and leadership roles examined from various perspectives and various fields of endeavor, such as science and technology, the arts, international leadership, and U.S. politics and policy. Prerequisite to WLP 102: WLP 101 or permission of the instructor. Concurrent registration in WLP 110–11 is required.

110–11 **Women and Leadership I Symposium** (1–1)
A series of special programs that complements WLP 101–2. Concurrent registration in WLP 101–2 is required.

120–21 **Women and Leadership II Symposium** (0 or 1 each)
A series of special programs and experiential learning. Concurrent registration in WLP 151 is required for WLP 120.

151 **Theory and Practice of Women's Leadership** (3)
Contemporary theories of leadership; factors affecting women as leaders; building leadership skills through experiential learning. Prerequisite: WLP 102 or permission of instructor. Same as Psyc 151.

WOMEN'S STUDIES

Professors D. Bell, H. Hartmann (*Research*), P.M. Palmer, B. Gault (*Research*)
Associate Professors C.E. Harrison, C. Deitch, D. Moshenberg (*Director*)
Assistant Professors A. Zucker, K. Pemberton
Adjunct Assistant Professors M. Frost, B. Morris
Lecturer N. Turner

Committee on Women's Studies
D. Bell, N. Cahn, C. Deitch, C. Gamber, B. Gault, C.E. Harrison, H. Hartmann, L. Jacobson, N. Mikhalevsky, D. Moshenberg, P.M. Palmer, A. Romines, G. Weiss, S. Wolchik, A. Zucker

Bachelor of Arts with a major in women's studies—The following requirements must be fulfilled:

1. The general requirements stated under Columbian College of Arts and Sciences.
2. Prerequisite course—WStu 1.
3. Required—30 credit hours consisting of WStu 120, 125, 199, plus seven courses from the four groups that follow, with a minimum of one course chosen from each group. A given course can fulfill only one group requirement. With approval of the program advisor, courses with appropriate subject matter may be substituted for those specified.

Women's studies—WStu 170, 183, 195.

Diversity/cross-cultural studies—AmSt/Hist/WStu 185; Anth/WStu 121; Chin/WStu 136; Engl 174; Phil 125; Span 140.

Humanities—AmSt/Hist/WStu 130, 139–40, 185; Chin/WStu 136; Clas 170; Engl 162, 174, 175; Hist 125; Phil 125; Rel/WStu 118, 181; Span 140.

Social science—Anth/WStu 121; Anth 150, 154, 157; Psyc 150; Psyc/WStu 152; Soc 166, 175.

Five-Year Bachelor of Arts with a major in women's studies and Master of Arts in the field of women's studies or in the field of public policy with a concentration in women's studies—Students interested in either of these dual degree programs should consult the Women's Studies Program office for requirements by the beginning of their junior year.

Special Honors—For Special Honors in women's studies, a major must meet the general requirements stated under University Regulations, attain a grade-point average of at least 3.7 in courses counted for the women's studies major and 3.3 overall, receive a grade of *A* in WStu 199, and submit an honors paper to the Women's Studies Program. Upon faculty review of the honors paper, the student may be recommended for graduation with Special Honors.

Minor in women's studies—18 credit hours, including WStu 120 and 125, plus four elective courses, of which at least three are at the 100 level, as approved by the advisor. Elective courses that are typically approved are listed under the women's studies major, above. Pertinent courses are frequently taught as departmental topics courses and in the 700 Series.

1 **Women in Western Civilization** (3) Morris and Staff
Exploration of critical periods of intellectual and cultural change in Western societies as influenced by and affecting women. Examination of images of women

and of changing ideal types of femininity and masculinity. Aspects of law, religion, art, culture, work, and politics in relation to these topics. Same as Hist 42. (Fall)

120 **Introduction to Women's Studies** (3) Gamber and Staff
A multidisciplinary examination of historical conditions, cultural norms, and social institutions that define women's status in Western culture. Experiences of girls and women in various racial–ethnic, class, and age groups. Alternative visions for women's (and, by implication, men's) roles and status. Sophomore standing required. (Fall and spring)

121 **The Anthropology of Gender: Cross-Cultural Perspectives** (3) Bell
Anthropological representations of gender relations in "other" cultures have provided important case material for feminist theorizing of sex differences and gender roles and statuses. How a cross-cultural approach can inform our understanding of gender. Same as Anth 121. (Spring)

125 **Varieties of Feminist Theory** (3) Deitch
Classical and contemporary texts on feminist explanations of women's status. Relationships within the sex/gender system and arrangements based on class and race. Evaluation, through the lens of feminist theory, of several academic disciplines in the sciences, social sciences, and humanities. Prerequisite: WStu 1 or 120 or permission of instructor. (Spring)

130 **Sexuality in U.S. History** (3) Staff
Same as AmSt/Hist 130.

135 **A Study of Women and Media** (3) Gamber and Staff
The role media plays in women's lives. The limits and effects of a "dominant" media; representations of women in print media and television, especially advertising, and in books and film. How women have attempted to articulate a culture that serves their personal, political, and social interests. (Summer)

136 **Chinese Women in Myth, Literature, and Film** (3) Frost
Same as Chin 136.

139–40 **Women in the United States** (3–3) Murphy, Harrison
Same as Hist/AmSt 139–40.

150 **Women in Judaism** (3) Staff
Same as Rel 118.

152 **Women and Psychology** (3) Zucker
Same as Psyc 152.

170 **Selected Topics** (3) Staff
Examination and analysis of central issues in women's studies, such as women and difference, women in media, women and violence, athletics and gender. Topic changes each semester; may be repeated for credit. (Fall and spring)

181 **Women in Western Religion** (3) Pemberton
Same as Rel 181.

183 **Practicum in Women's Studies** (3) Deitch
Study of the changing status of women through supervised assignment to public and private agencies engaged in policymaking, education, political action, and research. Usually for seniors. Placement arrangements must be made the semester prior to registration; departmental permission is required. (Spring)

185 **Black Women in U.S. History** (3) Alexander
Same as AmSt/Hist 185.

195 **Undergraduate Research** (1 to 3) Staff
A written proposal approved by the member of the faculty who will supervise the research is required prior to registration.

199 **Senior Seminar** (3) Bell and Staff
For students completing a major or minor in women's studies. Writings of contemporary scholars and writers whose work provides critical frameworks for feminist scholarship and research. Individual or collaborative research projects are presented and submitted as written papers. (Fall)

YIDDISH

See **Classical and Semitic Languages and Literatures.**

Faculty

FACULTY AND STAFF OF INSTRUCTION 2004–2005

(as of Fall 2004)

Columbian College of Arts and Sciences

School of Business

Graduate School of Education and Human Development

School of Engineering and Applied Science

Elliott School of International Affairs

EMERITI

Fred Paul Abramson, *Professor Emeritus of Pharmacology*
B.A. 1962, Case Western Reserve University; Ph.D. 1965, Ohio State University

Lewis Francis Affronti, *Professor Emeritus of Microbiology and Immunology*
B.A. 1950, M.A. 1951, State University of New York at Buffalo; Ph.D. 1958, Duke University

Frederick Amling, *Professor Emeritus of Business Finance*
B.A. 1948, Baldwin-Wallace College; M.B.A. 1949, Miami University; Ph.D. 1957, University of Pennsylvania

Avery DeLano Andrews, *Associate Professor Emeritus of History*
B.A. 1950, Harvard University; LL.B. 1953, M.A. 1958, Ph.D. 1962, University of Pennsylvania

Galip Mehmet Arkilic, *Professor Emeritus of Engineering and Applied Science*
B.S. in M.E. 1946, Cornell University; M.S. 1947, Illinois Institute of Technology; Ph.D. 1954, Northwestern University

Joseph Aschheim, *Professor Emeritus of Economics*
B.A. 1951, University of California, Berkeley; M.A. 1953, Ph.D. 1954, Harvard University

Robert Edward Baker, *Professor Emeritus of Education*
B.S. in Ed. 1939, State University of New York at Buffalo; M.A. 1954, Catholic University of America; M.A. in Ed. 1956, Ed.D. 1962, George Washington University

Ruth Lillian Aaronson Bari, *Professor Emeritus of Mathematics*
B.A. 1939, City University of New York, Brooklyn College; M.A. 1943, Ph.D. 1966, Johns Hopkins University

Shirley Russell Barnett, *Associate Professor Emeritus of Spanish*
B.A. 1944, Vassar College; M.A. 1946, Vanderbilt University; Ph.D. 1958, University of Minnesota

Otto Bergmann, *Professor Emeritus of Physics*
Ph.D. 1949, University of Vienna

Nancy Joan Belknap, *Professor Emeritus of Special Education*
B.S. 1966, University of Michigan; M.A. in Ed. 1970, George Washington University; Ed.D. 1978, American University

Lee Sheward Bielski, *Professor Emeritus of Speech Communication*
B.S. 1940, Ohio University; M.A. 1944, University of Michigan

Giorgio Vittorio Borgiotti, *Professor Emeritus of Engineering and Applied Science*
Eng.Dr. 1957, University of Rome

John Gordon Boswell, *Professor Emeritus of Education*
B.A. in Ed. 1953, M.A. in Ed. 1956, Ed.D. 1963, George Washington University

Lloyd Spencer Bowling, *Professor Emeritus of Speech and Hearing*
B.A. 1954, M.A. 1957, Ed.D. 1964, University of Maryland

George Robert Bozzini, *Associate Professor Emeritus of English*
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Marcella Brenner, *Professor Emeritus of Education*
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Frederick James Brown, Jr., *Professor Emeritus of Education*
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Robert Guy Brown, *Professor Emeritus of Sociology*
B.A. 1949, University of Rhode Island; M.A. 1951, Ph.D. 1960, University of North Carolina

James Franklin Burks, *Professor Emeritus of French*
B.A. 1951, M.A. 1952, University of Cincinnati; Ph.D. 1957, Indiana University

Elizabeth Burtner, *Professor Emeritus of Physical Education*
B.A. 1927, Hood College; M.A. 1935, Columbia University

Willard Edmund Caldwell, *Professor Emeritus of Psychology*
B.A. 1940, M.A. 1941, University of Florida; Ph.D. 1946, Cornell University

Ali Bulent Cambel, *Professor Emeritus of Engineering and Applied Science*
B.S. 1942, Robert College, Turkey; M.S. 1946, California Institute of Technology; Ph.D. 1950, University of Iowa

Edward Alan Caress, *Professor Emeritus of Chemistry*
B.A. 1958, Dartmouth College; Ph.D. 1963, University of Rochester

Bayard Lacey Catron, *Professor Emeritus of Public Administration*
B.A. 1963, Grinnell College; M.A. 1965, University of Chicago; M.C.P. 1972, Ph.D. 1975, University of California, Berkeley

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B.A. 1962, University of Colorado; M.P.A. 1965, Ph.D. 1966, University of Southern California; J.D. 1977, George Washington University

Mary Ann Bieter Coffland, *Associate Professor Emeritus of Romance Languages*
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Victor Hugo Cohn, *Professor Emeritus of Pharmacology*
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Mary Ellen Coleman, *Professor Emeritus of Education*
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Constance Christian Costigan, *Professor Emeritus of Design*
B.S. 1957, Simmons College; M.A. 1965, American University

Thomas Francis Courtless, Jr., *Professor Emeritus of Sociology*
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B.A. 1961, Swarthmore College; Ph.D. 1964, Johns Hopkins University

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John K. Donaldson, Jr., *Associate Professor Emeritus of English as a Foreign Language*
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Julian Eisenstein, *Professor Emeritus of Physics*
B.S. 1941, M.A. 1942, Ph.D. 1948, Harvard University

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Charles Fox Elliott, *Associate Professor Emeritus of Political Science and International Affairs*
B.A. 1953, Ph.D. 1964, Harvard University; M.A. 1958, University of California, Berkeley

Lloyd Hartman Elliott, *Professor Emeritus of Higher Education; President Emeritus of the University*
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Donald Michael Esterling, *Professor Emeritus of Engineering*
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James Edward Falk, *Professor Emeritus of Operations Research*
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James Elmer Feir, *Professor Emeritus of Civil Engineering*
B.S. 1950, University of Alberta, Canada; M.S. 1955, University of London; Ph.D. 1966, Cambridge University

Anthony Vincent Fiacco, *Professor Emeritus of Operations Research and Applied Science*
B.A. 1950, Union College, New York; Ph.D. 1967, Northwestern University

Nicolae Filipescu, *Professor Emeritus of Chemistry*
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Roderick Stuart French, *Professor Emeritus of Philosophy; Vice President Emeritus for Academic Affairs*
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Joseph Hilmy, *Professor Emeritus of Accountancy*
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Denis Michael Hitchcock, *Associate Professor Emeritus of Art*
B.A. 1967, University of California, Los Angeles; M.F.A. 1970, Ph.D. 1977, Princeton University

Herman Hedberg Hobbs, *Professor Emeritus of Physics*
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Joe Lee Jessup, *Professor Emeritus of Business Administration*
B.S. in B.A. 1936, University of Alabama; M.B.A. 1941, Harvard University; LL.D. 1964, University of Chungang, Korea

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B.A. 1949, M.A. 1951, Ph.D. 1957, George Washington University

Nancy Diers Johnson, *Associate Professor Emeritus of Dance*
B.S. 1955, University of Minnesota; M.A. 1966, University of Iowa; Ed.D. 1980, University of North Carolina at Greensboro

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Robert Wayne Kenny, *Professor Emeritus of History*
B.J. 1953, University of Texas; M.A. 1957, University of Minnesota; Ph.D. 1963, University of Chicago; M.F.A. 1984, George Washington University

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B.A. 1949, M.A. 1950, Ph.D. 1954, George Washington University

Ali Muhlis Kiper, *Professor Emeritus of Engineering*
M.S. in M.E. 1950, Technical University of Istanbul, Turkey; M.S. in M.E. 1954, Ph.D. 1956, Purdue University; P.E.

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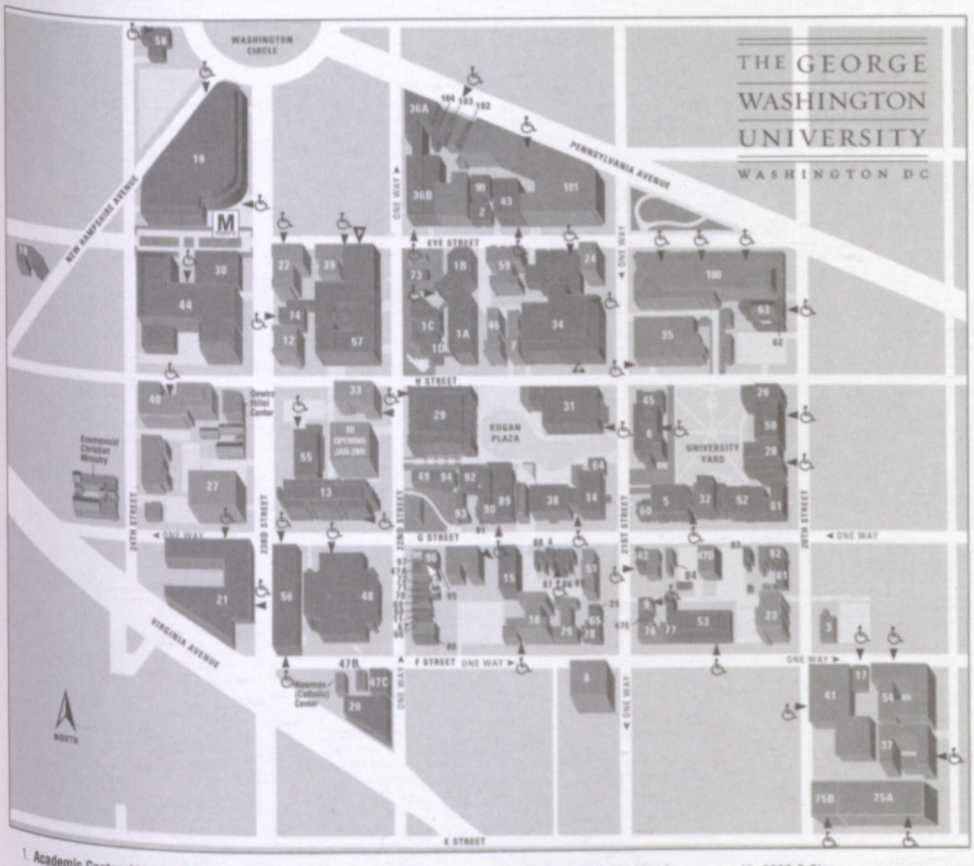
Graduate School of Education and Human Development: Master of Arts in Education and Human Development (M.A. in Ed.&H.D.), Master of Arts in Teaching (M.A.T.), Master of Education (M.Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

School of Business: Bachelor of Accountancy (B.Accy.), Bachelor of Business Administration (B.B.A.), Master of Accountancy (M.Accy.), Master of Business Administration (M.B.A.), Master of Science in Finance (M.S.F.), Master of Science in Information Systems Technology (M.S.I.S.T.), Master of Science in Project Management (M.S.P.M.), Master of Tourism Administration (M.T.A.), and Doctor of Philosophy (Ph.D.)

Elliott School of International Affairs: Bachelor of Arts (B.A.), Master of Arts (M.A.), Master of International Policy and Practice (M.I.P.P.), and Master of International Studies (M.I.S.)

School of Public Health and Health Services: Bachelor of Science (B.S.), Master of Science (M.S.), Master of Public Health (M.P.H.), Master of Health Services Administration (M.H.S.A.), Specialist in Health Services Administration (Spec.H.S.A.), and Doctor of Public Health (Dr.P.H.)

College of Professional Studies: Associate in Professional Studies (A.P.S.), Bachelor of Professional Studies (B.P.S.), and Master of Professional Studies (M.P.S.)



1. **Academic Center**, 801 22nd St.
   A. Phillips Hall
   B. Rome Hall
   C. Smith Hall of Art
   D. Visitor Center
2. **John Quincy Adams House** 2129-33 Eye St.
3. **Alumni House**, 1925 F St.
4. **Hortense Amsterdam House** 2110 G St.
5. **Bell Hall**, 2029 G St.
6. **Corcoran Hall**, 725 21st St.
7. **Crawford Hall**, 2119 H St.
8. **Dakota**, 2100 F St.
9. **Davis-Hodgkins House** 605 21st St.
10. **Ric and Dawn Duques Hall** 2201 F St.
11. **Abba Eban House**, 607 22nd St.
12. **Fulbright Hall**, 2223 H St.
13. **Funger Hall**, 2201 G St.
14. **Government, Hall of**, 710 21st St.
15. **GSEHD**, 2134 G St.
16. **Guthridge Hall**, 2115 F St.
17. **The George Washington University Club**, 1918 F St.
18. **The George Washington University Inn** 824 New Hampshire Ave.
19. **Hospital, GW**, 900 23rd St.
20. **International House** 2201 Virginia Ave.
21. **Ivory Tower Residence Hall** 616 23rd St.
22. **Kennedy Onassis Hall** 2222 Eye St.
23. **Francis Scott Key Hall** 600 20th St.
24. **Lafayette Hall**, 2100 Eye St.
25. **Lenthall Houses** 606–610 21st St.
26. **Lerner Hall**, 2000 H St.
27. **Lerner Health and Wellness Center**, 2301 G St.

LIBRARIES

28. **Jacob Burns** (Law), 716 20th St.
29. **Melvin Gelman** (University), 2130 H St.
30. **Paul Himmelfarb Health Sciences** (Medical), 2300 Eye St.
31. **Lisner Auditorium**, 730 21st St.
32. **Lisner Hall**, 2023 G St.
33. **Madison Hall**, 736 22nd St.
34. **Marvin Center**, 800 21st St.
35. **Media & Public Affairs** 805 21st St.
36. **Medical Faculty Associates** 2150 Pennsylvania Ave.
    A. H.B. Burns Memorial Bldg.
    B. Ambulatory Care Center
37. **Mitchell Hall**, 514 19th St.
38. **Monroe Hall**, 2115 G St.
39. **Munson Hall**, 2212 Eye St.
40. **New Hall**, 2350 H St.
41. **Old Main**, 1922 F St.
42. **Quigley's**, 619 21st St.
43. **Rice Hall**, 2121 Eye St.
44. **Ross Hall**, 2300 Eye St.
45. **Samson Hall**, 2036 H St., 729 21st St.
46. **Schenley Hall**, 2121 H St.
47. **Scholars Village Townhouses**
    A. 619 22nd St.
    B. 2208 F St.
    C. 520-526 22nd St.
    D. 2028 G St.
    E. 605-607 21st St.
48. **Smith Center**, 600 22nd St.
49. **Staughton Hall**, 707 22nd St.
50. **Stockton Hall**, 720 20th St.
51. **Strong Hall**, 620 21st St.
52. **Stuart Hall**, 2013 G St.
53. **Support Building**, 2025 F St.
54. **Thurston Hall**, 1900 F St.
55. **Tompkins Hall of Engineering** 725 23rd St.
56. **Townhouse Row**, 607 23rd St.
57. **University Garage**, 2211 H St.
58. **Warwick Bldg.**, 2300 K St.
59. **The West End**, 2124 Eye St.
60. **Woodhull House**, 2033 G St.
61. **700 20th St.**
62. **812 20th St.**
63. **814 20th St.**
64. **714 21st St.**
65. **600 21st St.**
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72. **617 22nd St.**
73. **837 22nd St.**
74. **817 23rd St.**
75. **1957 E St.**
    A. Academic
    B. Residential
76. **2033-37 F St.**
77. **2031 F St.**
78. **2101 F St.**
79. **2109 F St.**
80. **2147 F St.**
81. **2000 G St.**
82. **2002 G St.**
83. **2008 G St.**
84. **2030 G St.**
85. **2106 G St.**
86. **2108 G St.**
87. **2112 G St.**
88. **2114 G St.**
89. **2125 G St.**
90. **2127 G St.**
91. **2129 G St.**
92. **2129 G St.** (rear)
93. **2131 G St.**
94. **2131 G St.** (rear)
95. **2136 G St.**
96. **2138 G St.**
97. **2140 G St.**
98. **2142 G St.**
99. **2129-33 Eye St.** (rear)
100. **2000 Pennsylvania Ave.**
101. **2100 Pennsylvania Ave.**
102. **2136 Pennsylvania Ave.**
103. **2140 Pennsylvania Ave.**
104. **2142 Pennsylvania Ave.**

All addresses are in Northwest Washington.

For assistance or information call the GW Information Center (202) 994-GWGW.

For information on accessibility, call (202) 994-8250 (TDD/voice).

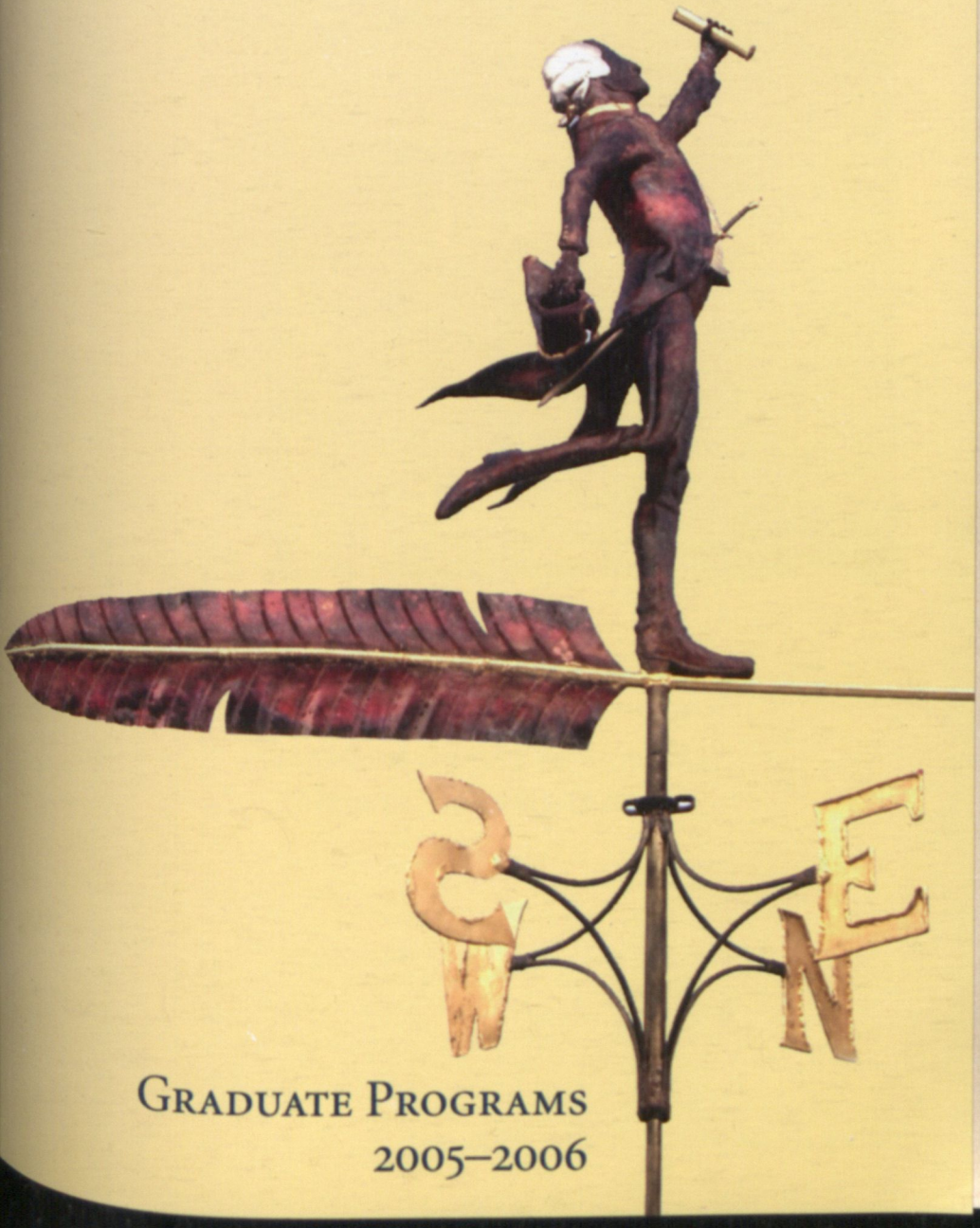
PARKING

Marvin Center (See #34)
University Garage (See #57)
Visitor parking entrance

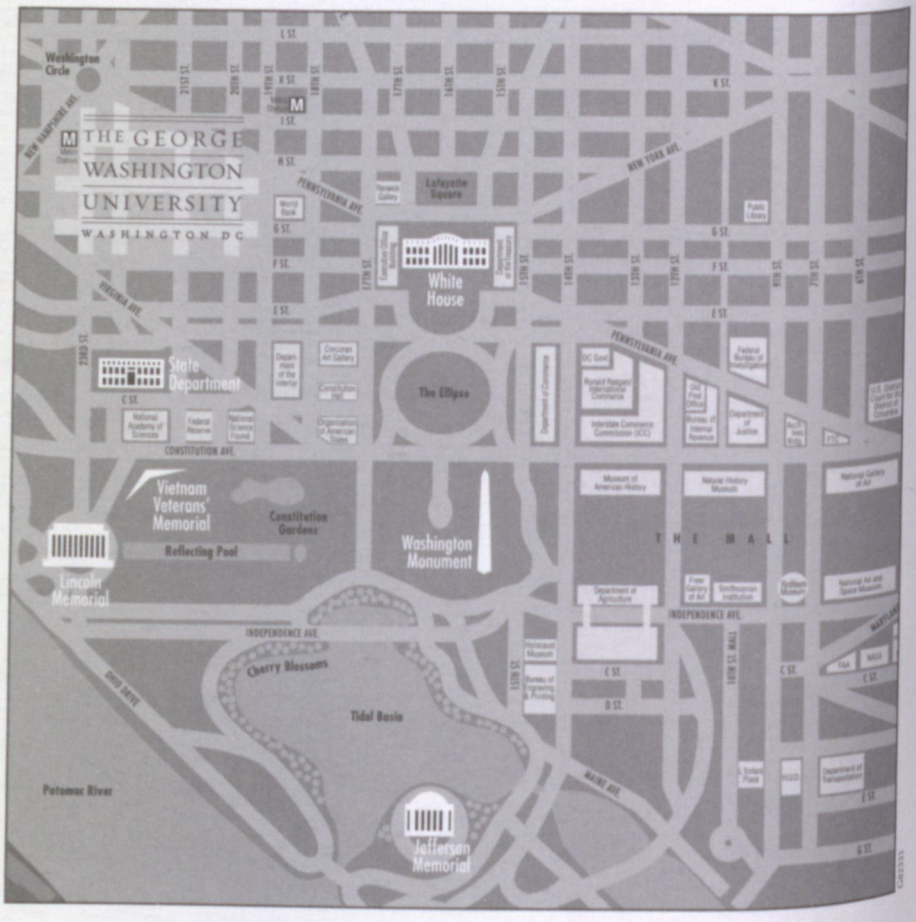
THE GEORGE
WASHINGTON
UNIVERSITY

WASHINGTON DC

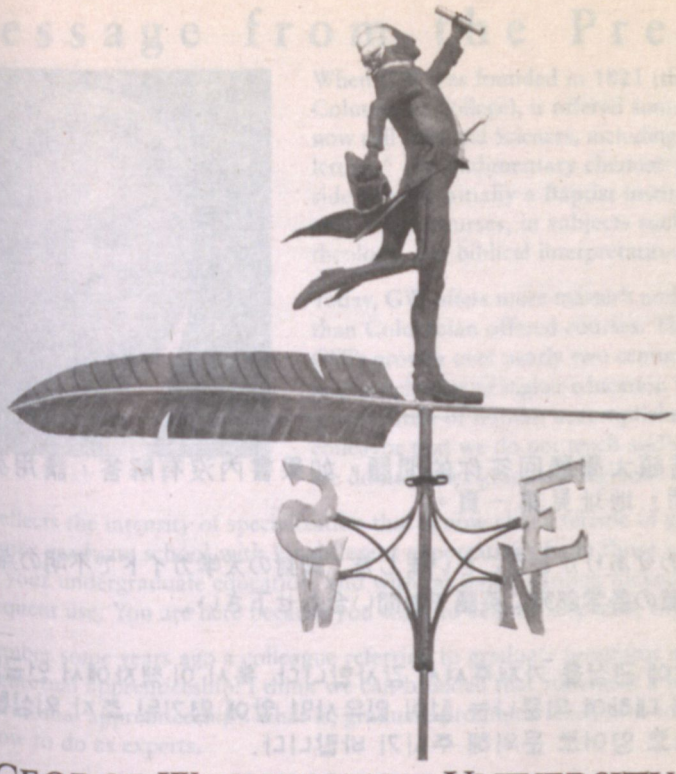
The George Washington University Bulletin



Graduate Programs
2005–2006



THE GEORGE WASHINGTON UNIVERSITY BULLETIN
Volume 104, Number 2, April 2005



THE GEORGE WASHINGTON UNIVERSITY BULLETIN

GRADUATE PROGRAMS 2005–2006

Columbian College of Arts and Sciences

School of Business

Graduate School of Education and Human Development

School of Engineering and Applied Science

Elliott School of International Affairs

College of Professional Studies

To e-mail an office at GW, see the online directory at www.gwu.edu. To write or call, address correspondence to the office concerned at The George Washington University, Washington, D.C. 20052; telephone (202) 994-1000. A brief directory appears on page 16 of this bulletin. The University publishes separate bulletins for Undergraduate Programs, the Law School, and the School of Medicine and Health Sciences. Information on the School of Public Health and Health Services is available on the GW website.

www.gwu.edu

喬治華盛頓大學願回答你的問題，如果書內沒有解答，請用英文書面詢問。地址見第一頁。

お問い合わせありがとうございました。同封の大学ガイドで不明の点は1ページ記載の各学部宛に英語でお問い合わせ下さい。

저희 대학에 관심을 가져주셔서 감사합니다. 혹시 이 책자에서 언급되지 않은 면에 대하여 의문나는 점이 있으시면 앞에 명기된 조지 워싱턴 대학교 주소로 영어로 문의해 주시기 바랍니다.

جامعة جورج واشنطن ترحب بكم وتشكر لكم اهتمامكم. برجاء الكتابة إلينا باللغة الانجليزية على عنواننا بالصفحة الأولى إذا كان لديكم أية استفسارات أخرى.

La Universidad de George Washington le agradece su interés. Si necesita información adicional a la incluída en este Boletín, por favor, diríjase por escrito, en inglés, a la dirección de George Washington University indicada en la primera página de esta publicación.

Information in this Bulletin is generally accurate as of fall 2004. The University reserves the right to change courses, programs, fees, and the academic calendar, or to make other changes deemed necessary or desirable, giving advance notice of change when possible.

Program information appears under the name of the department or program concerned in Columbian College of Arts and Sciences and the Elliott School of International Affairs. For the School of Business, the Graduate School of Education and Human Development, and the School of Engineering and Applied Science, program information appears under the school's entry.

Message from the President

When GW was founded in 1821 (then known as Columbian College), it offered some courses we might now call Arts and Sciences, including philosophy, "belles lettres," and rudimentary chemistry. On the religious side (it was initially a Baptist institution), it offered even more courses, in subjects such as preaching, theology, and biblical interpretation.

Today, GW offers more master's and doctoral programs than Columbian offered courses. This reflects not only GW's growth over nearly two centuries, but the growth and enrichment of higher education in America. There is very little of human accomplishment and human endeavor that we do not teach and study—or in which we do not offer graduate degrees.

This reflects the intensity of specialization that is now characteristic of graduate programs. You enter graduate school with far different expectations from those you had when you began your undergraduate education, and with far more learning tucked away, but handy, for frequent use. You are here because you want to acquire a specific expertise.

I remember some years ago a colleague referring to graduate programs as the final years of an intellectual apprenticeship. I think we can broaden that statement a bit and refer equally to operational apprenticeships. That is, graduate programs teach how to think as experts and how to do as experts.

You are, in most cases, nearing the end of your formal education, at least for the time being; the number of people returning to campuses in midlife is growing, and one day you may join their ranks. But, for the moment, the end of formal learning is in sight and you have your eyes on particular professional goals and, of course, employment in your chosen field.

But even so, I want you to take time and look at this bulletin carefully—not just in your own field. In fact, I hope that you will, at least occasionally, look farther afield and take a course or two outside your specialty.

I encourage you to do this, not at the expense of your expertise, but to leaven your expertise with other experiences and discoveries. In the same spirit, I encourage you to think of GW's libraries as storehouses of information, knowledge, and wisdom.

And I encourage you as well to adventure through the city of Washington, with its museums and music and culture, with its seats of power and policy nearby in the World Bank, the White House, and the State Department, and with its urban vibrancy. I suggest this not to offer you distractions but to offer useful counterweights to your intensive and specialized studies.

Most of all, I want to remind you that learning is never done. You may be, as I said, nearing the end of your formal education. But I have two fervent hopes. The first is that you have learned here at GW how to learn. And the second is that you will always want to learn—as much for personal discovery as for professional expertise.

Best wishes,

Stephen Joel Trachtenberg

Stephen Joel Trachtenberg
President

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THE ACADEMIC CALENDAR 2005–2006

August 2005

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2005 Fall Semester

August 31 Classes begin
September 3–5 Labor Day weekend (holiday)
Aug. 31–Sept. 9 Late registration
October 1 Applications due for winter graduation
November 8 Registration for spring semester classes begins*
November 24–25 Thanksgiving holiday
December 7 Designated Monday
December 9 Last day of regular fall semester classes
December 10 Makeup classes
December 10–12 Reading period
December 13–21 Examination period

2006 Spring Semester

January 17 Classes begin
January 17–27 Late registration
February 1 Applications due for May graduation
February 20 George Washington's birthday observed (holiday)
March 13–17 Spring recess
March 22 Registration for fall semester classes begins*
May 2 Makeup classes
May 3 Designated Monday
Last day of regular spring semester classes
May 4–5 Reading period
May 8–16 Examination period
May 21 Commencement

*Registration dates are tentative; consult the *Schedule of Classes*.

The University

Presidents of the University

1821–1827	William Staughton
1828–1841	Stephen Chapin
1843–1854	Joel Smith Bacon
1855–1858	Joseph Getchell Binney
1859–1871	George Whitefield Samson
1871–1894	James Clarke Welling
1894–1895	Samuel Harrison Greene, *Acting*
1895–1900	Benaiah L. Whitman
1900–1902	Samuel Harrison Greene, *Acting*
1902–1910	Charles Willis Needham
1910–1918	Charles Herbert Stockton
1918–1921	William Miller Collier
1921–1923	Howard L. Hodgkins, *ad interim*
1923–1927	William Mather Lewis
1927–1959	Cloyd Heck Marvin
1959–1961	Oswald Symister Colclough, *Acting*
1961–1964	Thomas Henry Carroll
1964–1965	Oswald Symister Colclough, *Acting*
1965–1988	Lloyd Hartman Elliott
1988–	Stephen Joel Trachtenberg

ABOUT THE UNIVERSITY

George Washington was determined to have a great national university in the nation's capital. His hope was that students from all parts of the country would gain a first hand knowledge of the practice as well as the theory of republican government while being instructed in the arts and sciences. He bequeathed 50 shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." Despite Washington's intentions, The Potomac Company folded and Congress never extended a "fostering hand," so the University did not take shape until a group of Baptist clergymen led by Reverend Luther Rice took up the cause. They raised funds for the purchase of a site and petitioned Congress for a charter. Congress insisted on giving the institution a non-sectarian charter which stated "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

Columbian College, as it was originally named, took up residence on College Hill, a 46-acre tract between the present 14th and 15th Streets extending from Florida Avenue to Columbia Road. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University.

By 1918, the University had moved to the Foggy Bottom neighborhood—between 19th and 24th Streets, south of Pennsylvania Avenue—in the heart of Washington, D.C. The more than 90 buildings, including 14 residence halls, are situated on 43 acres bordered by the White House, the John F. Kennedy Center for the Performing Arts, the State Department, and the World Bank, as well as numerous federal agencies, national galleries and museums.

GW's Virginia Campus, initiated for graduate studies, research projects, and professional development programs, is located along the high-tech corridor on Route 7, just to the west of Route 28, in Loudoun County. In 1998, GW established The George Washington University at Mount Vernon College; the Mount Vernon Campus is on Foxhall Road in Northwest Washington.

Currently, the University's enrollments total more than 24,000, of which 10,500 are undergraduates, over 12,000 are graduate and professional students, and more than 1,000 are nondegree students. The students come from all 50 states and about 130 different countries.

Mission Statement

The George Washington University, an independent academic institution chartered by the Congress of the United States in 1821, dedicates itself to furthering human well-being. The University values a dynamic, student-focused community stimulated by cultural and intellectual diversity and built upon a foundation of integrity, creativity, and openness to the exploration of new ideas.

The George Washington University, centered in the national and international crossroads of Washington, D.C., commits itself to excellence in the creation, dissemination, and application of knowledge.

To promote the process of lifelong learning from both global and integrative perspectives, the University provides a stimulating intellectual environment for its diverse students and faculty. By fostering excellence in teaching, the University offers outstanding learning experiences for full-time and part-time students in undergraduate, graduate, and professional programs in Washington, D.C., the nation, and abroad. As a center for intellectual inquiry and research, the University emphasizes the linkage between basic and applied scholarship, insisting that the practical be grounded in knowledge and theory. The University acts

as a catalyst for creativity in the arts, the sciences, and the professions by encouraging interaction among its students, faculty, staff, alumni, and the communities it serves.

The George Washington University draws upon the rich array of resources from the National Capital Area to enhance its educational endeavors. In return, the University, through its students, faculty, staff, and alumni, contributes talent and knowledge to improve the quality of life in metropolitan Washington, D.C.

The Schools

The George Washington University includes nine academic units, as follows:

Columbian College of Arts and Sciences offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, Bachelor of Fine Arts, Master of Arts, Master of Fine Arts, Master of Forensic Sciences, Master of Public Administration, Master of Public Policy, Master of Science, Master of Philosophy, Doctor of Philosophy, and Doctor of Psychology.

The School of Medicine and Health Sciences offers programs leading to the degrees of Bachelor of Science in Health Sciences, Master of Science in Health Sciences, and Doctor of Medicine.

The Law School offers programs leading to the degrees of Juris Doctor, Master of Laws, and Doctor of Juridical Science.

The School of Engineering and Applied Science offers undergraduate programs leading to the degrees of Bachelor of Science and Bachelor of Arts. Graduate programs lead to the degrees of Master of Science, Master of Engineering Management, Engineer, Applied Scientist, and Doctor of Science.

The Graduate School of Education and Human Development offers programs leading to the degrees of Master of Arts in Education and Human Development, Master of Arts in Teaching, Master of Education, Education Specialist, and Doctor of Education.

The School of Business offers programs leading to the degrees of Bachelor of Accountancy, Bachelor of Business Administration, Master of Accountancy, Master of Business Administration, Master of Science in Finance, Master of Science in Information Systems Technology, Master of Science in Project Management, Master of Tourism Administration, and Doctor of Philosophy.

The Elliott School of International Affairs offers programs leading to the degrees of Bachelor of Arts, Master of Arts, Master of International Policy and Practice, and Master of International Studies.

The School of Public Health and Health Services offers programs leading to the degrees of Bachelor of Science, Master of Science, Master of Public Health, Master of Health Services Administration, Specialist in Health Services Administration, and Doctor of Public Health.

The College of Professional Studies has been authorized to offer programs leading to the degrees of Associate in Professional Studies, Bachelor of Professional Studies, and Master of Professional Studies.

Accreditation

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Schools.

The University is on the approved list of the American Association of University Women and is a member of the College Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

The School of Medicine and Health Sciences has had continuous approval by its accrediting body, which is currently the Liaison Committee on Medical Edu-

cation, sponsored jointly by the American Medical Association and the Association of American Medical Colleges. The clinical laboratory science program is accredited by the National Accrediting Agency for Clinical Laboratory Science. The Commission on Accreditation of Allied Health Education Programs has accredited the programs in sonography and physician assistant in the School of Medicine and Health Sciences and the athletic training program in the School of Public Health and Health Services. The public health programs have full accreditation from the Council on Education for Public Health. The program in health services administration is accredited by the Accrediting Commission on Education for Health Services Administration.

All Bachelor of Science engineering curricula of the School of Engineering and Applied Science (excluding systems engineering) are accredited by the Engineering Accreditation Commission of ABET, Inc. The Bachelor of Science computer science curriculum is accredited by the Computing Accreditation Commission of ABET, Inc.

The Graduate School of Education and Human Development is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education for its eligible master's and doctoral degree programs; the master's programs in school and community counseling and the doctoral program in counseling are accredited by the Council for the Accreditation of Counseling and Related Educational Programs; the master's program in rehabilitation counseling is accredited by the Council on Rehabilitation Education.

The School of Business is a member of AACSB International–The Association to Advance Collegiate Schools of Business; the Association accredits its undergraduate and graduate business administration and accountancy programs. The programs in accountancy satisfy the educational requirements for the Certified Public Accountant and the Certified Management Accountant professional examinations.

The Elliott School of International Affairs is a member of the Association of Professional Schools of International Affairs.

In Columbian College of Arts and Sciences, the B.F.A. with a major in interior design is accredited by the Foundation for Interior Design Education Research. The Department of Chemistry is on the approved list of the American Chemical Society. The Department of Music is an accredited member of the National Association of Schools of Music. The Ph.D. program in clinical psychology in the Department of Psychology and the Psy.D. program in the Center for Professional Psychology are on the approved list of the American Psychological Association. The M.A. program in speech–language pathology is accredited by the Education and Training Board of the Boards of Examiners in Speech–Language Pathology and Audiology. The M.P.A. program is on the approved list of the National Association of Schools of Public Affairs and Administration.

The Board of Trustees of the University

The University is privately endowed and is governed by a Board of Trustees of which the President of the University is an *ex officio* member. Trustees who are GW alumni are indicated by an asterisk. Locations are indicated for trustees outside the Washington metropolitan area.

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Sheldon S. Cohen, *Chairman Emeritus*
John D. Zeglis, *Chairman Emeritus*
Charles T. Manatt, *Chairman*
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Bobbie Greene Kilberg, *President, Northern Virginia Technology Council*
*Eugene I. Lambert, *Partner, Covington & Burling*
Jonathan J. Ledecky, *Chairman, The Ledecky Foundation*
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*Kristy McDonnell, *Energy Engineer, Senior Analyst, Pace Global Energy Services*
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In addition to the elected members listed below, the President of the University is *ex officio;* the Vice President for Academic Affairs, the University Registrar, and the deans of the schools are administrative members; and a parliamentarian is selected by the Faculty Senate. In general, only primary appointments are listed below.

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Michael Scott Castelberry, *Professor of Special Education*
Joseph John Cordes, *Professor of Economics and International Affairs*
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Ralph O. Mueller, *Professor of Educational Research*
Randall Kent Packer, *Professor of Biology*
Donald C. Paup, *Professor of Exercise Science*
Richard Mark Robin, *Associate Professor of Russian*
Lilien Filipovitch Robinson, *Professor of Art*
David Leigh Shambaugh, *Professor of Political Science and International Affairs*
Yin-Lin Shen, *Professor of Engineering and Applied Science*
Gary Leonard Simon, *Professor of Medicine*
Paul Michael Swiercz, *Professor of Management Science*
Isabel Rodriguez Vergara, *Associate Professor of Spanish*
Harry S. Watson, *Professor of Economics*
Philip William Wirtz, *Professor of Management Science and Psychology*

Directory of University Offices

General Information (202)994-4949

Administrative Offices (all street addresses are Northwest Washington)

President	Rice Hall 802	(202)994-6500
Board of Trustees	Rice Hall 801	(202)994-8610
Executive Vice President for Academic Affairs	Rice Hall 813	(202)994-6510
Executive Vice President and Treasurer	Rice Hall 701	(202)994-6600
Provost and Vice President for Health Affairs	Ross Hall 713	(202)994-4356
Senior Vice President for Student and Academic Support Services	Rice Hall 402	(202)994-7210
Vice President for Advancement	2129 I Street	(202)994-6415
Vice President for Communications	Rice Hall 504	(202)994-8810
Vice President and General Counsel	2100 Penn Ave, #250	(202)994-6503
Columbian College of Arts and Sciences	Phillips Hall 107	(202)994-6210
School of Business	Hall of Government 206	(202)994-6380
Graduate School of Education and Human Development	2134 G Street	(202)994-6160
School of Engineering and Applied Science	Tompkins Hall 110	(202)994-6080
Elliott School of International Affairs	1957 E Street	(202)994-6240
Law School	Lerner Hall 102	(202)994-6288
School of Medicine and Health Sciences	Ross Hall 713	(202)994-3506
School of Public Health and Health Services	Ross Hall 125	(202)994-5179
College of Professional Studies	805 21st Street	(202)994-2083

Student Services Offices

Career Center	1922 F Street	(202)994-6495
Community Living and Learning Center	Fulbright Hall 104	(202)994-8345
Counseling Center	2033 K Street, #330	(202)994-5300
Dean of Students	Rice Hall 401	(202)994-6710
Disability Support Services	Marvin Center 436	(202)994-8250
Gelman Library	2130 H Street	(202)994-6845
Graduate Student Assistantships and Fellowships	Rice Hall 602	(202)994-6822
Graduate Student Enrollment Management	Rice Hall 603	(202)994-5984
GW Bookstore	Marvin Center	(202)994-6870
Information Technology Services	Rome Hall B101	(202)994-5530
International Services	2127 G Street	(202)994-6860
Mount Vernon Campus	2100 Foxhall Road	(202)242-6602
Office of University Students	812 20th Street	(202)994-1972
Special Academic Programs	812 20th Street	(202)994-6360
Student Accounts Services	Rome Hall 102	(202)994-7350
Student Activities Center	Marvin Center 427	(202)994-6555
Student Financial Assistance	Rice Hall 310	(202)994-6620
Undergraduate Admissions	Rice Hall 201	(202)994-6040
University Honors Program	2138 G Street	(202)994-6816
University Registrar	Rice Hall 101	(202)994-4900
Virginia Campus	Ashburn, VA	(703)729-8200

FEES AND FINANCIAL REGULATIONS

The following fees and financial regulations were adopted for on-campus programs for the academic year 2005–06. Information on tuition and fees for off-campus programs is published separately by the College of Professional Studies. Information on tuition and fees for the summer is available at www.gwu.edu/summer.

Tuition Fees

For students enrolled in graduate degree programs on the main campus in Columbian College of Arts and Sciences, the School of Business, the Graduate School of Education and Human Development, the School of Engineering and Applied Science, and the Elliott School of International Affairs: Tuition is charged at the rate of $924 per credit hour. In the School of Business, doctoral study is charged at the rate of $13,146 for two semesters, and the comprehensive charge for the Executive Master of Business Administration is $69,000. Nondegree students taking courses on the main campus are charged $1,011 per credit hour.

The following per-credit charges apply on the Virginia Campus: In the School of Business, open enrollment courses, $735; Accelerated Master of Business Administration courses, $924 plus a $500 program fee for each of the first three semesters. In the Graduate School of Education and Human Development, open enrollment courses, $735; Master of Education courses, $465. In the School of Engineering and Applied Science, open enrollment courses, $742. The following Virginia campus programs are each charged at a single fee for the full program: Executive Master of Science in Information Systems Technology; leading to the degree of Doctor of Education, Executive Leadership in Human Resource Development and Higher Education Administration; Executive Master of Engineering Management; Master of Science in the field of Telecommunications and Computers; Doctor of Science in the fields of Engineering Management and Systems Engineering. The fee schedule for these programs can be found at www.gwvirginia.gwu.edu/academics.

Voluntary Library Fee—Each semester, the Registration Schedule and Invoice includes a voluntary gift for the University libraries. Check the box labeled "Library Gift Decline" and omit the amount from your payment if you do not wish to include the library gift in your reimbursement to the University.

Continuing Research—All master's and doctoral students who have completed their required number of credits (including course work and thesis or dissertation research) must register each subsequent fall and spring semester for 1 credit hour of Continuing Research as specified by the regulations of the school concerned.

Additional Course Fees—Some courses carry additional fees, such as laboratory or material fees, charged by semester as indicated in course descriptions.

Special Fees and Deposits (Nonrefundable)

Application fee (all degree candidates)	$60
Student Association fee, per credit hour, to a maximum of $15 per semester	1
Late registration beginning the first day of the semester	80
Registration for continuous enrollment or leave of absence	35
Registration for Virginia campus and off-campus courses	35
Graduation fee	100
Late application for graduation (see Calendar)	35
Late payment fee (see Past Due Accounts, below)	75
Late authorization fee for third-party payment (see Third-Party Payment, below)	100

Returned check fee, charged a student whose check is improperly drafted, incomplete, or returned by the bank for any reason	35
Binding master's thesis	30
Microfilm service and binding dissertation	130
Elliott School of International Affairs fee (payable over four semesters [fall and spring] at $750 per semester for M.A. candidates and over two semesters [fall and spring] at $1,500 per semester for M.I.P.P. candidates)	3,000
Engineers' Council fee (charged all SEAS students), per semester	8
English test for international students (when required)	20
Transcript fee	5
Replacement of lost or stolen picture identification card	25
Replacement of diploma	50

Payment of tuition for thesis or dissertation research entitles the candidate, during the period of registration, to the advice and direction of the member of the faculty under whom the thesis or dissertation is to be written.

Postdoctoral Study—Those who have graduated from George Washington University with a Ph.D., Ed.D., or D.Sc. may continue any studies in the University without payment of tuition (contingent upon the availability of space) and may enjoy all University library privileges. Such graduates are required to pay the prevailing charge for one credit hour in order to establish their active membership in the University. The use of laboratory space and equipment is contingent upon availability, and the cost of all laboratory or special library material is paid by the graduate. Special arrangements for such privileges must be made with the dean two months in advance of the semester in which the graduate wishes to register. Postdoctoral work taken under this privilege may not be taken for credit.

Payment of Fees

A student who registers for classes in any semester or session incurs a financial obligation to the University. Payment of tuition and fees is due upon receipt of the Schedule and Invoice or at the time of registration. Except for students on the monthly payment plan, tuition is to be paid in full by the first day of the semester or upon registration if registration is after the first day of the semester. The University reserves the right to revoke the registration, effective to the beginning of the semester, of any student who fails to make full payment. Students whose registrations have been revoked or canceled for failure to make timely payments are not permitted to attend class and may not occupy University housing.

In addition to payment of tuition and fees, the University requires that a student confirm his or her registration. Students whose registrations are not confirmed by the third week of the semester may be canceled from all courses. Receipt of the tear-off portion of the Schedule and Invoice, typically mailed with the student's payment, is requested for confirmation of registration. All students whose registrations are not confirmed are notified in writing that their registrations will be canceled and are asked to contact the Student Accounts Office immediately. Charges for residence halls and meal plans are in accordance with license agreements signed by the student; questions concerning those charges should be referred to the Community Living and Learning Center or Business Services, respectively.

Monthly Payment Plan—This payment plan is open to all students and is available for the fall and spring semesters only. Students must complete and submit an application by August 15 for the academic year or by January 5 for the spring

semester to participate in the plan. Upon approval of the application, the student will be billed for each payment. The monthly payment plan for the academic year begins in June and ends in March, with the first five payments applied to the fall account and the second five applied to spring. For spring semester only, the plan begins in November and ends in March. Under the plan, all payments are due on the first of each month. The student will receive a monthly bill, but no interest or late fees will be charged provided payments are received as scheduled. Students who enroll in the plan after the first month must make up all payments to the month of enrollment. Interest and a late payment fee are assessed all accounts not paid in full by October 5 for fall and March 5 for spring. An outside vendor administers the plan and charges a one-time participation fee in addition to interest and late fees for any payments received late. For more information, see www.gwu.edu/~sao/payment_plan.html.

Third-Party Payment—The University accepts employer vouchers or purchase orders that are not contingent upon receipt of grades. Under all circumstances, the charges for tuition and fees remain the responsibility of the student. Authorization from a sponsor to be billed for a student's charges must be received in the Student Accounts Office by the end of the third week of the fall or spring semester. A late authorization fee may be incurred for responses received after these times. Bills are mailed to sponsors in October for the fall semester and in February for the spring semester. Should a sponsor fail to remit payment to the University, the University will contact the student for payment. Students whose employers or sponsors reimburse them for tuition and fees after receipt of grades must pay in full upon receipt of the Schedule and Invoice or at the time of registration to avoid interest, late fees, and/or cancellation of registration. Students whose tuition is paid in full or part by employee benefits or teacher tuition remission must pay any remaining balance by the stated due date to avoid interest, late fees, and/or cancellation of registration.

Past Due Accounts—Accounts that are past due are encumbered by the University. A student whose account is encumbered may not register for future semesters and may not receive diplomas or transcripts. Late payment fees and interest may also be assessed each month that the account has an overdue outstanding balance. Please see the University's Tuition Payment Disclosure Statement at www.gwu.edu/~sao/disclosurestatement.pdf for more information on those fees and billing practices. Accounts that are more than 90 days past due are referred to an agency and/or attorney for collection. The student is then responsible for all charges, costs, and fees due to, or incurred by, the University as well as all costs, fees, and charges incurred by the agency and/or attorney, including attorney's fees. Students whose registrations have been revoked or canceled for failure to make timely payments are not permitted to attend class and may not occupy University housing.

Dishonored/Returned Checks—A student whose check is returned unpaid by the bank for any reason will be charged a returned check fee and will be responsible for any associated costs and/or attorney's fees incurred by the University should a civil lawsuit or other collection effort be instituted to collect on such dishonored check. In any case where the University has reason to believe that a student presented a dishonored check in bad faith, the University may, in addition to any collection efforts, refer the matter to the proper authorities for criminal prosecution.

Withdrawals and Refunds

Applications for withdrawal from the University or from a course after the registration period must be made in accordance with procedures outlined under University Regulations in the sections Complete Withdrawal From the University, and Adding and Dropping Courses, respectively. Financial aid recipients must notify the Office of Student Financial Assistance in writing.

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule for the fall and spring semesters:

1. *Complete withdrawal from all courses (on-campus students)*:
   Withdrawal dated on or before the end of the first week of the semester 80%
   Withdrawal dated on or before the end of the second week of the semester ... 60%
   Withdrawal dated on or before the end of the third week of the semester 40%
   Withdrawal dated on or before the end of the fourth week of the semester 25%
   Withdrawal dated after the fourth week of the semester ..... None
2. *Partial withdrawal*: If the change in program results in a lower tuition charge, the refund schedule above applies to the difference.
3. Regulations governing student withdrawals as they relate to residence hall and food service charges are contained in the specific lease arrangements.
4. *Summer Sessions*: In cases of authorized withdrawals from courses, refunds of 75% of tuition and fees will be made for courses dropped within the first seven calendar days of the start of a session. No refund will be made for courses dropped thereafter.

Courses that do not follow the traditional semester may have different refund policies.

The above information regarding cancellation of tuition charges and fees after withdrawal from the University may not apply to entering students who are recipients of federal aid; those students should check with the Student Accounts Office for the applicable cancellation schedule. Refund policies of the University are in conformity with guidelines for refunds as adopted by the American Council on Education. Federal regulations require that financial aid recipients use such refunds to repay financial aid received for that semester's attendance. This policy applies to institutional aid as well.

In no case will tuition be reduced or refunded because of absence from classes. Authorization to withdraw and certification for work done will not be given a student who does not have a clear financial record.

FINANCIAL AID

The George Washington University offers a program of financial support for students, which includes assistantships, fellowships, traineeships, graduate scholarships, research appointments, part-time employment, the Federal Work–Study Program, and loans. Several forms of aid not based on financial need are available. In general, consideration for financial aid is restricted to students in good academic standing who meet the minimum grade-point average for particular awards and are not financially encumbered by any other University office.

The University reserves the right to ask for documentation necessary to determine aid eligibility. Documents submitted as part of aid applications become the property of the University and cannot be returned. Federal regulations require that the University report suspected cases of fraud or misrepresentation to the appropriate federal, state, and local authorities.

Gift aid (scholarships, grants, fellowships, assistantships, tuition awards, etc.) is taxable to the extent that it exceeds the allowable costs of tuition, fees, and required books and supplies or is dedicated to other costs, such as room and board. Federal grants may be taxable if, together with other gift assistance, they exceed the allowable costs.

Application and correspondence concerning assistantships, fellowships, traineeships, or graduate scholarships should be sent directly to the school concerned at The George Washington University. Unless otherwise specified, application and supporting credentials should be submitted no later than February 1 preceding the academic year for which the award is made. Application for admission to graduate study is a prerequisite for consideration.

Information in this section is accurate at the time this Bulletin is prepared for press. Future changes in federal regulations or institutional policies may alter the application requirements or program guidelines.

Office of Graduate Student Assistantships and Fellowships

The Office of Graduate Student Assistantships and Fellowships provides information on awards that may be used in support of graduate study. These awards are generally sponsored by foundations, professional and learned societies, industries, and other organizations.

Services are provided to entering and enrolled graduate students. Detailed information is available at www.gwu.edu/~fellows/fellows.

Assistantships

Research Assistantships—May be available in departments with faculty who are participating in sponsored research.

Research Scholar Assistantships—School of Engineering and Applied Science, GW/NASA–Langley Joint Institute for the Advancement of Flight Sciences, and Program for Research and Education in Space Technology, GW/NASA–Goddard Space Flight Center.

Graduate Teaching Assistantships—Available to graduate students in master's and doctoral programs in most departments of the University. A graduate teaching assistant receives financial compensation for a designated unit of service to the assistant's major department of instruction. All new graduate teaching assistants must attend an orientation program and enroll in an on-line course.

Community Facilitators—Available to graduate students in any field of study who are interested in working in University residence halls. Specific duties vary with the position, but basically consist of counseling, advising student groups, and administration. Remuneration includes salary and a furnished room for the academic year. All positions are part time, and staff members are required to

enroll as full-time students in degree programs. Further information may be obtained from the Community Living and Learning Center.

Fellowships, Scholarships, and Related Programs

University Fellowships—Available to graduate students in master's and doctoral programs in most departments of the University. Fellowships are based on scholarship and each fellow may receive a stipend and/or tuition allowance.

Research Traineeships—Available under numerous sponsored programs in a number of departments. Awards vary; information is available from the departments.

Other Fellowships, Scholarships, and Related Programs

Achievement Rewards for College Scientists Scholarships
American Civilization Fellowships
American Civilization Internships (Smithsonian Institution–George Washington University Cooperative Program)
American National Red Cross Fellowships
Angeline Anderson Scholarship Fund
Bank of America Fellowship
Robert R. Banville Scholarship Fund
Sylven Seid Beck Endowment Fund for Elementary Education
Bender Scholarship to the University of Cambridge
Florence Bichan/Scottish Rite Scholarships
Mary Darnell Blaney Fellowship in International Relations
Winfield Scott Blaney Fellowship in International Relations
John and Claudia Boswell Scholarship Fund
Letitia Woods Brown Fellowship in American Studies
Brown Scholarship Fund
Career Development Fellowships
Oliver T. Carr, Jr., Fellowships
Center for Washington Area Studies Fellowship
James Edward Miller Chapman Educational Foundation Scholarship
Children's National Medical Center Fellowships in Biomedical Sciences
Daewoo Corporation Scholarships
Daewoo Vietnamese Scholarship
Maria Davis European Studies Fellowships
Vincent J. DeAngelis Scholarship Fund
Deixler/Swain Graduate Scholarship in History
Dockery Endowment Scholarship
Eaton Scholarship
Eaves–Carden Graduate Scholarship
Evans Scholarship Fund in Art
Evans Scholarship Fund in Theatre and Dance
Fischer Family Fund
Rockwood H. Foster Memorial Scholarship Fund
James Harold Fox Scholarship Fund
Philip Friedlander, Jr., Scholarship in Entrepreneurship and Small Business Studies
Mary Hatwood Futrell Scholarship Fund
Global Leaders Fellowships
Leo and Lillian Goodwin Endowment Scholarship
Graduate Engineering Honors Fellowship Program
Mildred Green Memorial Endowment Fund
Griffith Family Scholarship Fund
GSPM Alumni Scholarship Fund
GSPM Faculty Scholarship Fund

Hampel Scholarship
Corey Hansen Scholarship Fund
Elizabeth Earle Heckmann Graduate Scholarship
Norris and Betty Hekimian Engineering Endowment
Herbst Family Graduate Fund
Thelma Hunt Graduate Fellowships in Psychology
Hyundai Scholarship Fund
Iran Research Fellowships
Douglas L. Jones Endowed Graduate Fellowship in Mechanical Engineering
Kylen and Heide Jones-Huffman Fund
Marvin L. Kay Fellowship in Finance
Rita H. Keller Scholarship Fund
Kellogg Graduate Scholarship
Kendrick Graduate Fellowship
Isabella Osborn King Research Fellowships
Larry King Graduate Scholarship
Wolfgang and Astrid Kraus Graduate Scholarships
Laurence F. Lane Graduate Scholarship in Political Management
Levitan Endowment Fellowships
Myron L. Loe Graduate Student Scholarship
Mary and Daniel Loughran Graduate Scholarships
Morris Louis Fellowship in Painting
W. Stanley Machen Graduate Fellowship in Civil Engineering
J. Willard Marriott Foundation Graduate Scholarships
George McCandlish Fellowship in American Literature
McConnell Endowment in Chemistry
Dorothy A. Moore Graduate Scholarship Endowment for International Education
James N. Mosél Scholarship Fund
National Council for Education and Human Development Endowed Scholarship Fund
National Institutes of Health Fellowships in the Biomedical Sciences
Phi Delta Gamma Scholarships
Policy Studies Graduate Fellowships
Poncelet Scholarships
Presidential Merit Fellowships
Public Administration Faculty–Alumni Scholarship
Shirley H. and Robert L. Richards Scholarship Fund
Thomas Bradford Sanders Fellowships
Schwoerer Graduate Scholarship
Scottish Rite Graduate Endowment Fellowships
Scottish Rite Graduate Fellowships in Childhood Language Disorders
Bourdon F. Scribner Graduate Student Scholarship in Chemistry
ServiceMaster Fellowship
J.B. and Maurice C. Shapiro Fellowships in International Affairs
Smithsonian–GW Fellowship in American Studies
Speech and Hearing Endowment
Turner Non-Profit Leadership Development Scholarship
Verizon Graduate Fellowships
Vest Graduate Scholarship
Jack C. Voelpel Memorial Fund
Washington Gas and Light Scholarship
Ann Gordon Webster Endowment for Anthropology
Ronald Barbour Weintraub Research Fellowships in Biological Sciences
Ruth Ann Parker Wells Scholarship

Ruth Ann Parker Wells and David Leonard Wells Endowment Scholarship Fund
Wolcott Foundation Scholarships
Helen and Sergius Yakobson Graduate Scholarship

Loan Funds

Federal Stafford Loans—The George Washington University is an eligible participant in the Federal Stafford Loan Program. Graduate students enrolled at least half time may apply for Subsidized Stafford Loan funds of up to $8,500 per year, based on their need as determined by a federally mandated formula based on the Free Application for Federal Student Aid (FAFSA). Stafford loans are variable-interest-rate loans, currently capped at 8.25%, with a repayment period up to 10 years; the government pays the interest while students are enrolled in school at least half time and for six months afterward. All graduate students may apply for an Unsubsidized Stafford Loan up to $18,500, less any subsidized amount received. Terms and conditions are the same, except that the student borrower is responsible for all interest that accrues on the unsubsidized amount during the in-school period; deferments are available. Graduate students must apply for, and be eligible for, a full Subsidized Stafford Loan before their eligibility for a Federal Perkins Loan or Federal Work–Study will be determined.

Students must file the FAFSA and designate GW to receive their information. In addition, students must submit the Loan Questionnaire for the current year and a completed Master Promissory Note application. Tax information for the current tax year (for example, 2004 for the 2005–2006 academic year) is required only for those selected for federal verification and for those who submit a Special Condition Form. Students who intend to use loan proceeds for payment of University charges at the time of registration should submit a loan application and all supporting documents to the Office of Student Financial Assistance by May 1 for the fall semester, October 1 for the spring semester, and March 1 for the summer sessions.

Note that federal statute requires multiple disbursements of Stafford loans. Recipients of one-semester-only loans receive loan proceeds in two disbursements. Students may not borrow against or take out an emergency loan on their next semester's loan disbursement until the first day of classes for that term.

Alternative Loans—In partnership with our preferred lenders, GW offers competitive alternative loan options to qualified students. These loans offer attractive interest rates and repayment options. The loans allow the student to borrow up to 100% of GW's annual graduate cost of attendance less any current financial assistance. More information can be obtained from our website gwired.gwu.edu/finaid.

Other Loan Funds—The following loan funds are available to degree students. Complete information regarding each loan fund is available from the Office of Student Financial Assistance, Fiscal Section.

American Medical Association Nursing Home Administration Loan Fund
George F. Henigan Loan Fund
International Student Loan Fund
Joanne Jacobs Student Loan Fund
W. K. Kellogg Foundation Hospital Administration Loan Fund
Jessie B. Martin Loan Fund
Jack and Anne Morton Loan Fund
Barney Plotnick, M.D., Student Loan Fund
Hiram Miller Stout Memorial Loan Fund
University Student Emergency Loan Fund
Edmund W. Dreyfuss Loan Fund
Peter and Doris Firsht Loan Fund

In addition, the Inner-City Special Student Assistance Loan Fund is available through the GW Multicultural Student Services Center.

Further information regarding need-based aid is available through the GW Office of Student Financial Assistance.

Student Employment

The University participates in the Federal Work–Study Program. Inquiries should be addressed to the Office of Fellowships and Graduate Student Support. In addition, the Career Center maintains a registry of both full-time and part-time positions available in the Washington area for undergraduate and graduate students. After registration, students may apply at the Center for interviews and referrals to positions for which they are qualified.

International Students

Limited awards for graduate teaching assistantships and University fellowships are the responsibility of the chairman of the department or dean of the school in which the degree is to be earned.

International students applying for graduate teaching assistantships must have minimum scores of 600 (paper-based) or 250 (computer-based) on the Test of English as a Foreign Language or an overall band score of 7.0 on the academic International English Language Testing System with no individual band score below 6.0. International students applying from outside the University may be appointed to graduate teaching assistantships but must successfully complete an orientation and evaluation program held prior to registration. Those found to have difficulties with English will be required to enroll in specified courses in English as a Foreign Language and/or will be referred to the Speech and Hearing Center's speech enhancement program; such students will be assigned nonteaching duties in place of classroom instruction. Such students will be reevaluated each semester; if they are not designated as qualified to give classroom instruction by the end of one academic year, the teaching assistantship will not be renewed.

Graduate students who are presently enrolled at GW and have been proposed as candidates for graduate teaching assistantships by their departments must pass the Test of English as a Foreign Language at the levels indicated above and will be required to complete successfully the English for International Students oral interview and the orientation and evaluation program before they will be considered for graduate teaching assistantships.

Students who wish to study in the United States should have sufficient funds available to cover expenses for one full year before attempting to enter a college or university. The cost at this University for one academic year (September–May) was $31,743 in 2004–05 for full-time students (9 credits per semester) and will be higher in 2005–06; generally speaking, expenses for international students are about $2,000 over the stated figure, which includes room and board, tuition, books, clothes, and incidental expenses, but not travel, holiday, or medical expenses.

Veterans Benefits

The Veterans Benefits office assists students entitled to educational benefits as active-duty personnel, veterans, or as widows or children of deceased or totally disabled veterans with any problems that may arise concerning their benefits. This office also processes certification of enrollment and attendance to the Veterans Administration so that educational allowances will be paid.

When feasible, students entitled to educational benefits as active-duty personnel, veterans, or dependents of veterans should consult with the veterans

counselor prior to submitting applications to the Veterans Administration. All such students should obtain the instruction sheet issued by the veterans counselor; it sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration and includes other information of general interest. Eligible students should be aware they must be admitted to a degree seeking program by the start of their third semester in order to continue receiving veterans benefits.

STUDENT SERVICES

Office of the Dean of Students

The Office of the Dean of Students provides counseling and information for students, administers the nonacademic student disciplinary system and student grievance procedures, administers medical withdrawals, and assists in nonacademic program development. Staff members are well informed on University policies and the various student services provided on campus, enabling them to provide referrals and answers to many questions concerning general student life. Personal letters of recommendation for students applying to graduate and professional schools can be obtained from this office.

Housing

Although the University does not provide residence hall space for graduate students, the Community Living and Learning Center refers graduate students to apartments as they become available in University-owned buildings in the campus area. With a Metro stop on-campus, GW is easily accessible via public transportation. An off-campus housing resource center can be reached at www.och.gwu.edu for listings, a mover's guide, neighborhood information, and on-line help.

Student Health Service

The Student Health Service is an outpatient clinic staffed by physicians, nurse practitioners, and physician assistants who can evaluate and treat most of students' medical problems. Visits should be arranged by appointment; urgent problems may be seen on a walk-in basis if necessary. Charges for visits, labwork, and medication apply. Psychiatric evaluation and short-term therapy appointments and crisis intervention are available. Health education and outreach programs on a variety of topics are provided throughout the year.

For serious emergencies occurring during hours when the Student Health Service is closed, students may go to the Emergency Room of the University Hospital for treatment. All fees are the responsibility of the student.

Students must be currently enrolled on campus in the University to receive treatment at the Student Health Service. Students enrolled in off-campus programs and continuing education programs are not eligible. The bills incurred from all services rendered outside of the Student Health Service (for example, x-ray work, laboratory work, and office visits to private physicians) are the responsibility of the student. Additional information is available at gwired.gwu.edu/shs.

Health and Accident Insurance

The University recommends that all students be covered by health and accident insurance. For information on health insurance offered through the University, contact the Chickering Group at 800-213-0579 or www.chickering.com.

Immunization Requirements

It is the law in the District of Columbia that all students under the age of 26 have a record on file with the Student Health Service documenting immunity to Measles, Mumps, and Rubella (two immunizations with the initial dose given after the first birthday or positive titers), Varicella (chickenpox—by immunization, documented history of disease or positive titers) and a current Tetanus/Diphtheria booster (within 10 years prior to the beginning of the semester). This requirement applies to all students regardless of their program of study or degree status. Students registering for the first time will be able to do so without complete records on file, but any subsequent registration will be blocked if this requirement has not been fulfilled. Immunization forms are sent out by the GW admitting office. Forms can be downloaded from gwired.gwu.edu/shs. In addition to the required immunizations, the Hepatitis B and Meningitis vaccines are recommended. The Student Health Service can give all inoculations on a fee for service basis. Further information is available at (202)741-2650.

University Counseling Center

University Counseling Center services help students resolve personal, social, career, and study problems that can interfere with their academic progress and success. Services include individual counseling, crisis intervention, group counseling, and workshops on topics such as time management, study skills, procrastination prevention, family and relationship issues, stress management, conflict management, and self-esteem/self-development. The Center offers consultation and training programs for student, faculty, and staff groups. Career counseling and referral services are available to GW students. The Center provides pamphlets, books, and tapes through its self-help library. Further information about all services and links to other psychoeducational materials can be obtained by visiting the Center's website at gwired.gwu.edu/counsel.

Career Center

The Career Center promotes effective career planning, teaches job search strategies, and facilitates contacts between GW students, alumni, and prospective employers through its many services. Services include full- and part-time job listings; internship listings; career consulting; workshops (including job search strategies, letters and resumes, and effective interviewing); a career resource room; on-campus interviewing; resume critiques; facilitating the federal work–study program; cooperative education; computer- and Internet-based job resources; and a credentials service that supports graduate/professional school applications. Additional information is available at gwired.gwu.edu/career.

International Services Office

The International Services Office provides services to GW's international students, scholars, faculty, and staff. The office provides advising on a variety of personal issues, including cultural adjustment, living conditions, academic concerns, and finances; provides immigration assistance and information on U.S. government requirements and regulations specific to the international community; conducts orientation programs to assist in living, studying, and working in the United States; and serves as a resource center for the University community on issues of cross-cultural understanding.

Disability Support Services

Disability Support Services provides and coordinates support services for students with a wide variety of disabilities, as well as those temporarily disabled by injury or illness. Accommodations are available through DSS to facilitate academic access for students with disabilities. Services provided without charge to the student may include orientation to campus, registration assistance, readers, interpreters, scribes, learning disabilities advising, adaptive materials and equipment, assistance with note taking, laboratory assistance, test accommodations, regular advising, and referrals. DSS does not provide content tutoring, although it is available on a fee basis from other campus resources. The University does not pay for personal attendant care. DSS is located on the 2nd floor of the Marvin Center and is open from 9 a.m. to 5 p.m. weekdays and at other times by appointment.

Student Activities Center

The Student Activities Center furthers the educational mission of the University by offering programs, services, and facilities that foster the social and cultural development and school spirit of members of the University community. Staff members assist individual students and campus organizations with event planning, program coordination, and participation in special projects.

Programs and activities include advisement of campus organizations, registration of student organizations, planning and coordination of major campus events, and oversight of Greek Affairs, Colonial Inauguration, the Presidential Administrative Fellows Program, band and cheerleading, and intramural and club sports. Additional information about the services offered by the Student Activities Center, and about the various student organizations and committees, can be obtained from the *Student Planner and Handbook*.

Program Board—The Program Board, composed chiefly of elected and appointed students, has the primary responsibility of allocating resources for student programming on campus. In addition, the Program Board provides funding for activities presented by various campus organizations and encourages student participation in program planning through involvement in committees on the arts, concerts, festivals, films, parties, political affairs, and public relations.

Student Government—The George Washington University Student Association is made up of all full-time and part-time undergraduate and graduate students who are registered for academic credit on campus. A body of elected and appointed individuals is responsible for representing the interests of students at the University. The Student Association provides various services for students, such as academic evaluations, test and syllabus files, and the Student Advocate Service.

Student involvement in the governance of the University is also possible through participation in various administrative and Faculty Senate committees, advisory councils of the schools and college, selected committees of the Board of Trustees, and specialized bodies, such as the Residence Hall Association, the Joint Food Services Board, and the Marvin Center Governing Board. This involvement has helped develop policies and programs beneficial to students and to the University community as a whole.

Student Organizations—Students are encouraged to become involved with existing student organizations or to initiate their own. There are approximately 350 registered organizations on campus, covering a broad spectrum of interests, including academic, professional, international, cultural, political, service, sports, hobbies, recreational, religious, and meditative groups as well as social fraternities and sororities.

The Cloyd Heck Marvin Center

The Marvin Center is the GW campus community center. The Marvin Center offers programs, services, and facilities for students, faculty, staff, alumni, and

University guests. The Center's wide range of facilities includes dining locations, a theatre, lounges, recreational facilities, study rooms, travel agency, copy center, provisions grocery, GW Concierge, GW bookstore, and conference and meeting rooms in the Morris and Gwendolyn Cafritz Foundation Conference Center. The Marvin Center provides facilities for programs conducted by the University Program Board, by academic departments that include the performing arts, and by other University organizations.

The Marvin Center Governing Board is a representative body composed of students, faculty, staff, and alumni. The Board works closely with the Center's staff in the review and development of policies, guidelines, and procedures that direct the operation of the Center.

Religious Life

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the religious organizations of their own choice. Several religious bodies sponsor various groups and form a link between the University and the religious community. The advisors of the religious organizations are available for counseling to enhance religious life on campus. Religious services and special observances are also provided for the University community as announced.

Major Program Events

Art Exhibits—The work of locally, nationally, and internationally known artists is shown in exhibitions in the Luther W. Brady Art Gallery in the Media and Public Affairs Building. Student art exhibits are presented each semester in the Dimock Gallery in Lisner Auditorium.

Concert Series—The Department of Music presents a series of concerts featuring faculty, guest, and student artists throughout each year. Other concerts are held regularly on campus.

Dance—The Department of Theatre and Dance presents major dance concerts, informal studio performances, experimental events, television appearances, and lecture–demonstrations. Students may audition to participate and have the opportunity to choreograph, perform, and gain experience in the technical aspects of dance productions.

Glee Club, Jazz Band, and Orchestra—The University Singers, University Band, Jazz Band, and Orchestra are available to students as credit courses or as cocurricular activities; major performances are presented to the University community several times a year, including regular winter and spring concerts. Chamber groups and jazz combos are regularly available for participation by all students.

Program Board—The University Program Board, through its various committees and in cooperation with other campus groups, regularly sponsors films, lectures, concerts, social activities, and special events.

Theatre—The Department of Theatre and Dance produces four major plays and musicals during the year on the proscenium/thrust stage in the Dorothy Betts Marvin Theatre. Additional works, including original and experimental plays, are produced in a more intimate studio theatre. Students can participate in all aspects of theatre and may receive credit toward their B.A. or M.F.A. degrees for some of their production work.

Athletics, Recreation, and Intramurals

The Charles E. Smith Center and Lerner Family Health and Wellness Center offers many facilities for student use, including courts for basketball, volleyball, and badminton; a jogging track; a swimming pool; gymnastics and weight rooms; racquetball and squash courts; and a sauna and lockers. A broad program of intramural and recreational activities is held in the Lerner Family Health and Wellness Center and designed to accommodate various levels of skill, experience,

and interest. The Mount Vernon campus is home to an artificial-turf soccer/lacrosse/field hockey facility, a softball field, and 32 tennis courts.

The University is a member of the National Collegiate Athletic Association (NCAA), the Eastern College Athletic Conference (ECAC), and the Atlantic 10 Conference. Its intercollegiate varsity teams compete against major universities throughout the region and nation in such sports as basketball, baseball, soccer, tennis, golf, cross-country, crew, swimming and diving, water polo, volleyball, and gymnastics.

OTHER PROGRAMS AND SERVICES

The major sections that follow describe the graduate programs and courses offered by Columbian College of Arts and Sciences, the School of Business, the Graduate School of Education and Human Development, the School of Engineering and Applied Science, and the Elliott School of International Affairs. This section briefly indicates some of the University's additional programs, services, and administrative units.

Research Centers and Institutes

The University seeks to ensure the close integration of research and teaching, including the employment of students in sponsored projects and the use of research facilities for instructional purposes. See University Regulations for policies governing patent and copyright and the use of human subjects.

Aviation Institute (*V. Motevalli*)
Center for the Advanced Study of Human Paleobiology (*B. Wood*)
Center for Aging, Health, and Humanities (*G. Cohen*)
Center for Curriculum, Standards, and Technology (*M. Futrell*)
Center for Digestive Diseases (*B. Bouscarel*)
Center for Education and Human Service in Acquired Brain Injury (*J. Ruoff*)
Center for Educational Leadership and Transformation (*S. McDade*)
Center for Equity and Excellence in Education (*C. Rivera*)
Center for Excellence in Public Leadership (*J. Robinson*)
Center for Global Health (*R. Skolnik*)
Center for Health Services Research and Policy (*S. Rosenbaum*)
Center for Injury Prevention and Control (*M. Berkeley*)
Center for Innovation in Public Service (*K. Newcomer*)
Center for Integrative Medicine (*J. Pan*)
Center for Intelligent Systems Research (*A. Eskandarian*)
Center for International Science and Technology Policy (*N. Vonortas*)
Center for Latin American Issues (*J. Ferrer, Jr.*)
Center for Law Practice Strategy and Management (*J. Pyle*)
Center for Nuclear Studies (*W. Briscoe*)
Center for Real Estate and Urban Analysis (*R. Green*)
Center for Rehabilitation Counseling, Research, and Education (*D. Dew*)
Center for Risk Science and Public Health (*T. Guidotti—Acting*)
Center for the Study of Combustion and the Environment (*H. Miller, C. Mavriplis*)
Center for the Study of Language and Education (*J. Gomez*)
Center for the Study of Learning (*M. Gorman*)
Center for the Study of Public History and Public Culture (*T. Murphy, J. Horton*)
Center for Survey Research (*L. Willnat*)

Center for Urban Environmental Research (*L. Benton-Short*)
Center for Washington Area Studies (*R. Hanson*)
Cyber Security Policy and Research Institute (*C.D. Martin*)
Dean Dinwoodey Center for Intellectual Property Studies (*M. Adelman*)
Documentary Center at The George Washington University (*N. Seavey*)
European Union Research Center (*S. Rehman*)
First Federal Congress Project (*C. Bickford*)
GW Biostatistics Center (*S. Fowler*)
GW Cancer Institute (*S. Patierno*)
GW Center for Networks Research (*H.A. Choi*)
GW Center for the Study of Globalization (*J. Forrer*)
GW Institute for Biomedical Sciences (*L. Werling*)
GW Institute for Spirituality and Health (*C. Puchalski*)
GW Transportation Research Institute (*vacant*)
George Washington Institute of Public Policy (*H. Wolman*)
Global and Entrepreneurial Finance Research Institute (*T. Barnhill*)
Hamilton Fish Institute on School and Community Violence (*B.C. Glenn*)
Institute for Biomedical Engineering (*J. Hahn*)
Institute for Communitarian Policy Studies (*A. Etzioni*)
Institute for Computer Graphics (*J. Hahn*)
Institute on Crime, Justice, and Corrections (*J. Austin, W. Chambliss*)
Institute for Crisis, Disaster, and Risk Management (*J. Harrald*)
Institute for Education Policy Studies (*J. Gomez*)
Institute for Ethnographic Research (*R. Grinker*)
Institute for European, Russian, and Eurasian Studies (*J. Goldgeier*)
Institute for Global and International Studies (*D. Avant*)
Institute for High-Speed Telecommunications (*B. Vojcic, S. Subramaniam*)
Institute for Knowledge and Innovation Management (*M. Stankosky, W. Halal*)
Institute for Magnetics Research (*E. Della Torre*)
Institute for Materials Science (*D. Ramaker, C. Gilmore*)
Institute for MEMS and VLSI Technologies (*M. Zaghloul*)
Institute for Mental Health Initiatives (*S. Martin—Acting*)
Institute for Politics, Democracy, and the Internet (*C. Darr*)
Institute for Proteomics Technology and Applications (*A. Vertes, F. Kashanchi*)
Institute for Reliability and Risk Analysis (*N. Singpurwalla*)
International Institute of Tourism Studies (*T. Hilliard*)
International Rule of Law Center (*S. Karamanian*)
Lipid Research Clinic (*J. Hsia*)
National Crash Analysis Center (*vacant*)
National Health Policy Forum (*J. Jones*)
Prevention Research Center (*A. El-Mohandes*)
Ronald Reagan Institute of Emergency Medicine (*R. Shesser, J. Smith*)
Eleanor Roosevelt and Human Rights Project (*A. Black*)
Sigur Center for Asian Studies (*M. Mochizuki*)
Space and Advanced Communications Research Institute (*J. Pelton*)
Space Policy Institute (*J. Logsdon*)
Wertlieb Educational Institute for Long-Term Care Management (*R. Burke*)

Welling Professors

The George Washington University has a category of distinguished "occasional" professorships known as the Welling Professors. The professorships are named for James Clark Welling, who was president of GW for most of the last quarter of the 19th century, during which time this institution assumed many of the attributes of a modern research university. The intent of the Welling Professorships, established in 1995, is to bring internationally distinguished scholars to GW on an occasional basis and engage them in the intellectual life of students and faculty through public lectures, small group discussions, and other forums.

Office of University Students

The Office of University Students makes main-campus, credit-bearing courses available to those who are not currently degree candidates at this University. Such students, often employed in government or industry, may be taking courses to enhance their career potential or as a matter of personal interest. They may be candidates for higher degrees at other institutions, sent here for special work as part of a graduate program. They may be undergraduates matriculated elsewhere, taking courses for transfer to their own institution or preparing for graduate work.

The Office of University Students requires a minimum registration of 3 credit hours per semester or session, except in special circumstances as approved by the director. Medical and law courses are not available to nondegree students.

Entrance Requirements—The Office of University Students requires visiting, nondegree applicants to have appropriate academic preparation prior to enrollment. Prerequisites are specified in the departmental course descriptions in this Bulletin. Contact the specific department for further information regarding appropriate academic background for a particular course. In addition, the applicant who has previously attended this or another college or university must be in good standing at that institution. An applicant who has been suspended from any educational institution for poor scholarship will not be considered for admission for one calendar year after the effective date of the suspension. An applicant who has been denied admission within this University will not be considered for admission as a nondegree student for the same semester for which the application was denied. Online applications for admission through the Office of University Students are necessary for all nondegree students. For information on registration, please refer to the *Schedule of Classes* or visit www.gwu.edu/~ous.

Tuition and Fees—For information regarding fall and spring semester tuition and fees, see Fees and Financial Regulations in this Bulletin. For information regarding summer tuition and fees, see the Summer Sessions Announcement, available by request, by contacting 202-994-6360 or gwsummer@gwu.edu. Information is also available through the GW Summer Sessions website: www.summer.gwu.edu.

Regulations—Prospective and registered students are urged to acquaint themselves with the regulations concerning attendance and withdrawal under University Regulations in this Bulletin or at the OUS website at www.gwu.edu/~ous.

The deadline for adding a course during the regular fall and spring semester is the end of the second week of classes. A course dropped during the first four weeks of classes will not appear on a student's transcript. A course dropped after the fourth week but before the end of the eighth week will be assigned the grade of *W* (Authorized Withdrawal). The deadline for dropping a course without academic penalty is the end of the eighth week of classes. The deadline for complete withdrawal from a student's entire program of courses without academic penalty is the end of the ninth week of classes.

If the symbol *I* (Incomplete) is assigned, the instructor normally sets a period (maximum of one year) within which the uncompleted work must be made up. An Incomplete that is not changed within one calendar year becomes a grade of *IF* on the student's record.

All adjustments to course schedules during a regular summer session must be made within the first seven days of the official start of classes.

Summer Sessions

Courses are offered during the summer by all degree-granting divisions of the University. Summer Sessions also offers special programs that are not available during the regular academic year. Courses are offered during both day and evening hours. Students who are enrolled at the University for the spring semester may register for the following Summer Sessions without special application. Those who wish degree status may seek admission from the appropriate

school within the University. Those who do not wish to work toward a degree at the University may apply through the process described in the Summer Sessions Announcement. For a complete statement concerning summer term work, see the Summer Sessions Announcement available by request by contacting 202-994-6360 or gwsummer@gwu.edu. Information is also available through the GW Summer Sessions website: www.gwu.edu/summer.

Consortium of Universities of the Washington Metropolitan Area

The George Washington University is a member of the Consortium of Universities of the Washington Metropolitan Area. Twelve universities in the Washington area—American University, Catholic University of America, Gallaudet University, George Mason University, George Washington University, Georgetown University, Howard University, Marymount University, Southeastern University, Trinity University, the University of the District of Columbia, and the University of Maryland—are associated in a Consortium through which they coordinate the use of their respective facilities. Students in approved programs leading to degrees in any one of these institutions have the opportunity to select from the combined offerings the particular courses that best meet their needs. This privilege is subject to regulations of the school in which the student is enrolled. Participation is limited to degree candidates. Law and medical students are excluded from participation, except for LL.M. candidates. See the *Schedule of Classes* for specific regulations and information concerning registration for Consortium courses.

Registration forms and instructions are available from the registrar of the institution in which the student is enrolled. Students register and pay tuition at their own institutions for all Consortium courses; course fees are payable to the visited institutions.

The University Libraries

The George Washington University is a member of the Association of Research Libraries. The library collections of the University are housed in the Melvin Gelman Library (the general library of the University), Jacob Burns Law Library, Paul Himmelfarb Health Sciences Library, Virginia Campus Library, and Eckles Memorial Library on the Mount Vernon campus.

These collections contain over 2 million volumes. University appropriations supplemented by endowments and gifts provide research materials in the social sciences, the humanities, the sciences, and business. Gifts from many sources have enriched the collections, including a large National Endowment for the Humanities grant to strengthen the University's humanities holdings. The libraries hold over 18,000 serials.

Information concerning the use of the libraries may be obtained from the GW Information System, Gelman home page, and at library service desks. Individual and class instruction in the use of the library and orientation to library facilities are given by librarians upon request as well as through print, media, and computer-assisted instruction. The libraries strive to fulfill the curricular and research needs and interests of the students. Through computerized searches of bibliographic databases, students identify and locate desired research materials not easily found through more traditional methods. The staff assists all members of the University in using the rich resources of the Washington area and the unusual opportunities they offer for extensive research.

Students, faculty, and staff at George Washington University (except law and medical students) may borrow directly from the main campus libraries of six other academic institutions in the Washington Research Library Consortium (WRLC). Students may also obtain books and journal articles on interlibrary loan from other libraries in the area and throughout the United States.

ALADIN is the electronic library resource of WRLC and contains the combined on-line catalog of the seven member universities with more than 3 million records representing almost 5 million volumes, as well as a rich array of electronic databases, indexes, and full texts. ALADIN can be accessed from numerous computers in the libraries as well as remotely from on and off campus.

Information Systems and Services (ISS)

ISS provides technology services to students, faculty, and staff, including e-mail accounts, web hosting space, training, and technical support for commonly used software and University systems.

Center for Academic Technologies

The Center for Academic Technologies supports all aspects of instruction, including assisting faculty in the development of new teaching approaches and materials and the operation of the University's many technology-enhanced classrooms and computer laboratories, which are available to all students for class projects and individual research.

The Writing Center

The Writing Center provides writing assistance to GW students for all courses, both undergraduate and graduate, in all schools of the University and at all levels of experience and expertise. Students receive assistance in identifying writing problems and learning how best to express ideas. Trained tutors (undergraduate peer tutors, graduate students, and the director and other members of the faculty) work with students individually on areas of specific need or interest. Tutors provide assistance in such areas as organizing a mass of information efficiently and clearly, using correct grammar and punctuation, getting started on a writing project, developing a thesis, providing evidence in support of an argument, and presenting the findings of an experiment or the solution to a research problem.

The Speech and Hearing Center

The Speech and Hearing Center provides diagnosis and treatment of a wide range of speech, language, and hearing disorders. These include developmental impairments of articulation and language, stuttering, voice disorders, and speech and language impairments resulting from neurological damage. Services are available for persons wishing to modify a regional dialect or foreign accent. Evaluation and aural rehabilitation are also provided for hearing-impaired individuals. The Speech and Hearing Center operates in conjunction with the Department of Speech and Hearing Science.

Prizes

The following academic prizes are supported by permanently endowed funds established through the Office of the Vice President and Treasurer. The many other prizes and awards available to GW students are funded annually, rather than by permanent endowment, and are listed in the annual commencement program when information is provided in time for publication.

Elizabeth B. Adams Prize—Awarded annually by the Department of Management Science to a graduating student for outstanding performance in the field of information systems management. The recipient is selected on the basis of scholarship, leadership within the Department, contributions to the University, and service to the community.

Sylvia L. Bunting Prize—Awarded annually to a graduate student in the field of biology or zoology.

John Henry Cowles Prizes—Two prizes, established by John H. Cowles, Grand Commander of the Supreme Council of Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America. Awarded upon graduation to the graduate or undergraduate student with the best overall scholastic achievement and leadership potential in the School of Business and in the Elliott School of International Affairs.

Ching-Yao Hsieh Prize—Two prizes awarded annually, one to an undergraduate and one to a graduate student in the Department of Economics.

Cecille R. Hunt Prize—Offered annually to deserving art students.

Elmer Louis Kayser Prize—Established by Paul and Elizabeth Rutheiser to be awarded annually by the Department of History for the best thesis in history submitted by a candidate for the degree of Master of Arts.

Minna Mirin Kullback Memorial Prize—Established in 1968 by Solomon Kullback in memory of his wife. Awarded annually by a committee of faculty members of the Department of Statistics to a full-time undergraduate or graduate student majoring in statistics, who will have completed 18 credit hours of statistics courses by the end of the spring semester.

Laurence Leite Prize—Awarded annually to a second-year M.A. candidate in art history.

Martin Mahler Prize in Materials Testing—Awarded to the upper-division or graduate student in engineering who submits the best reports on tests in the materials laboratory course, with preference given to prestressed concrete tests.

Nicole M. Paul Prize—Awarded annually to a first-year master's degree candidate in the Women's Studies Program.

Howard C. Sacks Prize—Awarded to a student in political science who has demonstrated outstanding academic achievement in the study of Far Eastern affairs.

Julian H. Singman Prizes—Two prizes awarded annually, one in design and one in aquarelle painting.

Alfred E. Steck Memorial Prize—Awarded for proven excellence in the field of sculpture.

Charles Clinton Swisher Historical Club Prize—Established in 1936 by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Swisher. Awarded annually to the student who submits the best essay covering some phase of medieval history.

James H. Taylor Graduate Mathematics Prize—Established in memory of James H. Taylor, former Professor of Mathematics at the University. Awarded annually to a graduate student for outstanding performance in mathematics.

Patricia M. Toel Memorial Prize—Awarded annually to a graduate student in photography to recognize outstanding achievement.

Benjamin D. Van Evera Memorial Prize—Awarded annually to that Graduate Teaching Fellow in Chemistry selected as the most effective teacher during the current academic year.

Thomas F. Walsh Prize—Established in 1901 and awarded annually to the student who submits the best essay in Irish history.

Alexander Wilbourne Weddell Prize—Established in 1923 by Virginia Chase Weddell in memory of her husband. Awarded annually to a degree candidate who writes the best essay on "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

W.T. Woodson Prize—Awarded annually to a graduate student demonstrating outstanding achievement in educational administration in the Graduate School of Education and Human Development.

GW Alumni Association

The objectives of this organization are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Membership in the Association is conveyed automatically to anyone who has been graduated from any school or division of the University. Anyone who has earned 15 credit hours or the equivalent at the University, who has left the University in good standing, and whose class has graduated is eligible for membership; in the case of the Office of University Students, however, only the "15 credit hours earned" requirement and not the "graduation of the class" requirement applies. Graduates of Center for Professional Development certificate programs are also eligible.

A Governing Board, composed of members representing the constituent alumni organizations, directs the activities of the Association. The voluntary leadership of the Association works closely with the staff of the Office of Alumni Relations in carrying out Association affairs. The Association may be contacted through the Office of Alumni Relations.

UNIVERSITY REGULATIONS

Students enrolled in the University are required to conform to the following regulations and to comply with the requirements and regulations of the school in which they are registered. Students who withdraw or are suspended, or who, for any other reason, are not registered at the University for one semester or more, may reapply and, if readmitted, continue their program only under the regulations and requirements in force at the time of return.

If a student knowingly makes a false statement or conceals material information on an application for admission or any other University document, the student's registration may be canceled. If such falsification is discovered after the student has matriculated at the University, the student may be subject to dismissal from the University. Such a student will be ineligible (except by special action of the faculty) for subsequent registration in the University.

Registration

Information on registration procedures is stated on the Registrar's Office website and in the *Schedule of Classes*, which is available in advance of each semester.

Registration in courses is open only to those persons formally admitted to the University by the appropriate admitting office and to continuing students in good standing.

Students may not register concurrently in this University and another institution without the prior permission of the dean of the school in which they are registered in this University. With the exception of students enrolled in a joint degree program, registration in more than one school of the University requires the written permission of the deans concerned, prior to registration. Registra-

tion is not complete until all financial obligations have been met. Individuals without a valid registration may not attend class or earn any course credit.

Eligibility for Registration—Registration for the following categories of on-campus students is held on the days of registration published in the *Schedule of Classes*. A student who is suspended or whose record is encumbered for any reason is not eligible to register. Registration in a given course may be denied to nondegree students by the Office of University Students when space is needed for degree candidates.

New Student—Upon receipt of a letter of admission, the new student is eligible for registration on the stated days of registration.

Readmitted Student—A student previously registered in the University who was not registered during the preceding semester must apply for and be granted readmission by the appropriate admitting office before being eligible for registration.

Continuing Student—A student registered on campus in the immediately preceding semester or the summer session preceding the fall semester is eligible to register assuming good standing and enrollment in a continuing program.

Completion of Registration—Registration is not complete until financial obligations have been fulfilled. Students who do not complete their financial obligations in a timely manner may have their registration canceled and will not be permitted to attend class.

Registration for Consortium Courses—Degree students interested in taking courses at any of the other institutions in the Consortium of Universities of the Washington Metropolitan Area, Inc., should consult the program announcements of the other institutions. Consortium registration forms and instructions may be picked up in the Office of the Registrar. In order to participate in the Consortium program, students must obtain the approval of an advisor and should ascertain from the department of the institution where the course is taught whether they are eligible for the course and whether there is space in the class. Specific inquiries should be addressed to the Registrar's Office. Detailed information concerning Consortium policy and procedures is printed in the *Schedule of Classes* and is available on the Registrar's Office website.

Adding and Dropping Courses

During the registration period (before the end of the second week of classes) students may add or drop courses using GWeb. After the second week of classes, students who wish to add or drop a course must complete a Registration Transaction Form and submit the form to the office of their dean; forms are available on line, at deans' offices, and in the Office of the Registrar. Adding a course after the second week requires a signature of the instructor or other authorized member of the department.

A course dropped during the first four weeks of classes will not appear on the student's transcript. A course dropped after the fourth week but before the end of the eighth week will be assigned a notation of *W* (Authorized Withdrawal).

The deadline for dropping a course without academic penalty is the end of the eighth week of classes in the fall and spring semesters. After the end of the eighth week of classes, dropping a course without academic penalty is only possible after the student presents a petition to the dean and receives written permission.

All charges for courses from which the student withdraws are subject to the refund policy listed under Fees and Financial Regulations in this Bulletin. Failure to withdraw by these procedures can result in an extended financial obligation and the recording of a grade of *F* (Failure) or a notation of *Z* (Unauthorized Withdrawal).

Changes in Program of Study

Changes Within a School—A student may not substitute one course for another within an established program of study or change status from credit to audit or from audit to credit without the approval of the dean of the school in which he or she is registered. Change from one major field to another within the same school may be made with the approval of the dean.

Transfer Within the University—Application for transfer to another school must be made to the appropriate admitting office on the form provided by the office concerned.

Grades

Grades are made available to students through the Office of the Registrar after the close of each semester. The following grading system is used: *A*, Excellent; *B*, Good; *C*, Minimum Pass; *F*, Fail; other grades that may be assigned are *A−*, *B+*, *B−*, *C+*, and *C−*. Symbols that may appear include *CR*, Credit; *AU*, Audit; *I*, Incomplete; *IPG*, In Progress; *W*, Authorized Withdrawal; *Z*, Unauthorized Withdrawal.

Except for courses that specifically state that repetition for credit is permitted, a candidate for a degree at this University may not repeat a course in which a grade of *C−* or better was received, unless required to do so by the department concerned. A written statement to this effect must be submitted to the student's dean by the appropriate department chair.

The symbol of *Z* is assigned when students are registered for a course that they have not attended or have attended only briefly, and in which they have done no graded work. At the end of the academic year, students' records are reviewed; if there is more than one *Z* per semester, a student's record will be encumbered until released by the student's advisor or academic dean. The symbol of *Z* is not a grade but an administrative notation.

Incompletes—The symbol *I* (Incomplete) indicates that a satisfactory explanation has been given the instructor for the student's inability to complete the required course work during the semester of enrollment. At the option of the instructor, the symbol *I* may be recorded if a student, for reasons beyond the student's control, is unable to complete the work of the course, and if the instructor is informed of, and approves, such reasons before the date when grades must be reported. This symbol may be used only if the student's prior performance and class attendance in the course have been satisfactory. Any failure to complete the work of a course that is not satisfactorily explained to the instructor before the date when grades must be turned in will be graded *F*, Failure. If acceptable reasons are later presented to the instructor, that instructor may initiate an appropriate grade change, which in all cases will include the symbol *I*. The course work must be completed within the designated time period agreed upon by the instructor and student, but (except in the School of Business) no more than one calendar year from the end of the semester in which the course was taken. In the School of Business, the symbol *I* must be changed by a date agreed on by the instructor and the student, but no later than the last day of the examination period for the fall or spring semester immediately following the semester or summer session in which the symbol *I* is assigned. When work for the course is completed, the instructor will complete a grade change form and turn it in to the Office of the Registrar. The grade earned will be indicated in the form of *I*, followed by the grade. The indication of *I* cannot be removed and remains on the student's permanent academic record even after the course has been successfully completed. If work for the course is not completed within the designated time, the grade will be automatically converted to a grade

of *IF*, Incomplete/Failure, 0 quality points, and the grade-point average and academic standing recalculated.

The Grade-Point Average—Scholarship is computed in terms of the grade-point average, obtained by dividing the number of quality points by the number of credit hours for which the student has registered, both based on his or her record in this University. The grade-point average is computed as follows: *A*, 4.0; *A*−, 3.7; *B*+, 3.3; *B*, 3.0; *B*−, 2.7; *C*+, 2.3; *C*, 2.0; *C*−, 1.7; *F*, 0, for each credit hour for which the student has registered in a degree program. Although credit value for a course in which a grade of *F* is earned appears on the transcript for the purpose of calculating the grade-point average, no academic credit is awarded. In the case of a student who is allowed to repeat a course, the first grade received remains on the student's record and is included in the grade-point average. Courses marked *AU, CR, I, IPG, W,* or *Z* are not considered in determining the average, except that courses marked *I* will be considered when a final grade is recorded. With the exception of Consortium courses, grades in courses taken at other institutions are not considered in computing the grade-point average.

Graduation Requirements

Degrees are conferred in January, May, and August. To be recommended by the faculty for graduation a student must have met the admission requirements of the school in which registered; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree as stated in this bulletin; filed an application for graduation by the published deadline date; and be free from all indebtedness to the University. Enrollment is required for the semester or summer at the close of which the degree is to be conferred, and all degree requirements must be completed by the last day of final examinations for that semester or summer session.

Participation in the Commencement Ceremony—Participation in the annual commencement ceremony held in May is open to students who have applied to graduate in the current spring semester or who graduated the preceding fall semester or summer session. With the exception of doctoral candidates, all students, graduate or undergraduate, who need no more than 9 credit hours to complete their degree requirements, may participate in May commencement ceremonies if there is a reasonable expectation that they will be able to obtain the needed credits during the following summer. The maximum of 9 credit hours is firm and not subject to petition.

Doctoral candidates who have not successfully defended their dissertation may not participate in either the May commencement or hooding ceremony. The commencement program does not include names and dissertation titles of doctoral candidates who have not successfully defended their dissertation by the end of March, although such students may attend the commencement and hooding ceremony if they have completed all requirements by the end of the spring semester.

Students who apply after the published deadlines are not guaranteed commencement materials and may not be listed in the commencement program. Summer graduates who elect to attend the preceding May ceremony must apply for graduation no later than February 1.

Scholarship and Residence—Students must meet the scholarship and residence requirements for the degree for which they are registered.

Curriculum—Minimum curriculum requirements for each degree are stated under the school offering work in preparation for the degree. In cases where specific curricular information is not provided in this Bulletin, the program of study, as indicated by the program faculty, must be completed.

Thesis or Dissertation—A thesis or dissertation submitted in partial fulfillment of requirements for a degree must be presented in its final form by the deadline set by the school concerned. Accepted theses and dissertations, with accompanying drawings, become the property of the University and are deposited in the University's Gelman Library, where the duplicate copies are bound and made available for circulation. See the appropriate school in this Bulletin for regulations governing theses and dissertations.

Continuous Enrollment Status

Once entered in a degree program, a student is expected to be continuously enrolled and actively engaged in fulfilling the requirements for the degree each semester of the academic year until such time as the degree is conferred. A student is considered to be continuously enrolled when registered for courses or when engaged in and appropriately registered for activities such as the following, with the prior approval of the school in which the student is enrolled: cooperative work semester; study abroad program; attendance at another institution with prior approval to have work transferred back to the GW program; completion of outstanding work in courses in which a grade of Incomplete or In Progress was received (at the undergraduate level); or non-course instructional activities unique to the particular school. This status is generally limited to one year. Should the student break continuous enrollment at the University and not request and be granted a leave of absence (see below), he or she must apply for readmission and, if granted, be subject to the requirements and regulations then in force.

Leave of Absence

Should a degree student find it necessary to interrupt active pursuit of the degree, he or she may petition the dean for a leave of absence for a specific period of time, generally limited to one calendar year. A degree student who discontinues active enrollment in degree studies without being granted a leave of absence, or a student granted a leave who does not return to active study at the close of the period of approved absence, must apply for readmission and be subject to the regulations and requirements then in force. The right to use of University facilities is suspended while the leave is in effect.

Policy Regarding Students Called to Active Military Duty

Any student who is a member of a military reserve unit or the National Guard and is activated or called to active duty early in a semester or summer session automatically will be entitled to a full refund of all tuition and fees that he or she has paid toward the expenses of that academic term. If the notification of the call to active duty comes after the mid-term examinations or after other substantial graded work has been completed, the student will have the option of either taking a full refund of tuition and fees or taking an Incomplete in his or her courses with the privilege of returning to complete all required course work at some future date without payment of any further tuition and fee charges. It is the responsibility of the student to present evidence of his or her activation to the Office of Student Accounts and to request the appropriate refund.

Should a degree student called up for active duty find it necessary to interrupt active pursuit of the degree, he or she may petition the dean for a leave of absence for a specified period of time, generally limited to one calendar year. Deans are encouraged to grant any request to extend the leave of absence for longer than the customary period should military service require an absence of more than one year.

All students on active duty will be automatically exempted from the request for a $50 voluntary library contribution without requiring any communication from them or their initials on the bill.

Complete Withdrawal From the University

A degree-seeking student who wishes to withdraw from all courses during a given semester must complete a Complete Withdrawal Form and submit it to the Office of the Registrar. Forms are available on line, at deans' offices, and in the Office of the Registrar. The deadline for complete withdrawal from all courses without academic penalty is the end of the ninth week of classes. Complete withdrawal after the ninth week requires a petition to the dean.

All charges for courses from which the student withdraws are subject to the refund policy listed under Fees and Financial Regulations in this Bulletin. Failure to complete a Complete Withdrawal Form can result in an extended financial obligation and the recording of grades of *F* (Failure) or notations of *Z* (Unauthorized Withdrawal).

University Policies and Definitions

University Policy on Equal Opportunity—The George Washington University does not unlawfully discriminate against any person on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation. This policy covers all programs, services, policies, and procedures of the University, including admission to educational programs and employment. The University is also subject to the District of Columbia Human Rights Law.

Inquiries concerning the application of this policy and federal laws and regulations regarding discrimination in education or employment programs and activities may be addressed to Susan B. Kaplan, Associate Vice President for Human Resources, The George Washington University, Washington, D.C. 20052, (202)994-4433, or to the Assistant Secretary for Civil Rights of the U.S. Department of Education.

Academic Integrity—The University community, in order to fulfill its purposes, must establish and maintain guidelines of academic behavior. All members of the community are expected to exhibit honesty and competence in their academic work. Incoming students have a special responsibility to acquaint themselves with, and make use of, all proper procedures for doing research, writing papers, and taking examinations. Members of the community will be presumed to be familiar with the proper academic procedures and held responsible for applying them. Deliberate failure to act in accordance with such procedures will be considered academic dishonesty. Acts of academic dishonesty are a legal, moral, and intellectual offense against the community and will be prosecuted through the proper University channels. Copies of the University Code of Academic Integrity can be obtained from all department chairs, all academic deans, the Registrar, and the Vice President for Academic Affairs.

Patent and Copyright Policies—Students who produce creative works or make scientific discoveries while employed or supported by the University or through substantial use of University resources are subject to the University's patent and copyright policies (see http://www.gwu.edu/~research/policies.htm under Intellectual Property).

Human Research Requirements—Students who are planning to conduct research involving the use of human subjects (for a thesis, dissertation, journal article, poster session, etc.) must obtain Institutional Review Board (IRB) approval before collecting any data. In order to receive this approval, contact the Office

of Human Research (Ross Hall, Suite 712, 202-994-2715, or see www.gwumc.edu/research/human.htm) to submit the study for the approval process.

The Library—All students registered in the University have the privilege of using the University's Gelman Library. Its stacks are open, and all students are welcome to browse. Authorized GW identification is needed to enter the library and to borrow books. Any book that circulates is subject to recall by the library if needed for reserve or requested by another user after a minimum of 20 days. Reserve books must be used in the library, except that they may be withdrawn for overnight use two hours before closing time. Transcripts of grades are withheld until a student's library record is clear, with all borrowed books returned and any fines paid. All students using the University's Gelman Library are expected to be familiar with its detailed regulations, available at any of the library's service desks.

Use of Correct English—A report regarding any student whose written or spoken English in any course is unsatisfactory may be sent by the instructor to the dean of the school, who may assign supplementary work, without academic credit, varying with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the dean.

Name of Record—A student's name of record includes the first name, middle initial or full middle name, and the family name. Nicknames may not be used. The University will change the name of a currently enrolled student on its official records but will require satisfactory evidence of a legal basis for the change. The diploma is awarded under the official name of record at the time of graduation.

Student Status—For the purpose of defining student status, graduate students taking 9 or more credit hours per semester (6 credits in the summer) are considered to be full time, those taking 5 to 8 credits per semester are considered to be half time, and all others are considered to be part time.

Attendance—Students may attend only those classes for which they are officially registered. Regular attendance is expected. Students may be dropped from any course for undue absence. A student suspended for any cause may not attend classes during the period of suspension. Students are held responsible for all of the work of the courses in which they are registered, and all absences must be excused by the instructor before provision is made to make up the work missed.

Credit—Credit is given only after completion of registration in a course and satisfactory completion of the required work, or upon the assignment of advanced standing in accordance with the regulations of the school concerned. Credit that has been applied to the completion of a degree may not subsequently be applied to another degree.

Auditing—A person who has been admitted to the University may be registered, with the permission of the instructor, as an auditor in a class (no academic credit). An auditor is not required to take active part or to pass examinations. A student who takes a course as an auditor may not repeat it later for credit. Tuition is charged at the prevailing rate. Under no circumstance may a student change from audit status to credit status or vice versa after the end of the eighth week of classes.

Post-Admission Transfer Credit—Students who plan to attend another institution and apply credit so earned toward graduation from this University must

first secure the written approval of their dean. In no event will credit in excess of what might be earned in a similar period in this University be recognized.

Transcripts of Record—Official transcripts of student records are issued upon written request of the student or former student who has paid all charges, including any student loan installments, due the University at the time of the request. A nominal fee is charged for each official transcript. Unofficial copies of transcripts are available to students, by written request, at a nominal fee. Partial transcripts are not issued. Students have access to their unofficial student record through the GWeb Information System.

Student Conduct—All students, upon enrolling and while attending The George Washington University, are subject to the provisions of the *Guide to Student Rights and Responsibilities,* which outlines student freedoms and responsibilities of conduct, including the Code of Student Conduct, and other policies and regulations as adopted and promulgated by appropriate University authorities. Copies of these documents may be obtained from the Office of the Dean of Students or from the offices of the academic deans. Sanctions for violation of these regulations may include permanent expulsion from the University, which may make enrollment in another college or university difficult. Regulations or requirements applicable only to a particular program, facility, or class of students may not be published generally, but such regulations or requirements shall be published in a manner reasonably calculated to inform affected students.

Right to Dismiss Students—The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

Right to Change Rules and Programs—The University reserves the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine. The right is reserved by the University to make changes in programs without notice whenever circumstances warrant such changes.

University Policy on the Release of Student Information—The Family Educational Rights and Privacy Act (FERPA) applies to institutional policies governing access to and release of student education records.

The University may release the following directory information upon request: name, local address including e-mail, and telephone number; name and address of emergency contact; dates of attendance; school of enrollment; field of study; enrollment status; credit hours earned; degrees earned; honors received; participation in University-recognized organizations and activities (including intercollegiate athletics); and height, weight, and age of members of athletic teams, as well as likenesses used in University publications. A student who does not wish such directory information released must file written notice to this effect in the Office of the Registrar.

The University's full policy statement on the release of student information is published in the *Guide to Student Rights and Responsibilities,* available in the Office of the Dean of Students or the offices of the academic deans. The full statement also appears in the *Schedule of Classes* and on the Registrar's Office website.

Student Identification Number/Social Security Number—The George Washington University uses the Social Security Number (SSN) to identify records pertaining to individual students, as well as to identify the student for purposes of financial aid eligibility and disbursement and repayment of financial aid and other debts payable to the University. The SSN is required when applying for

financial aid. The Internal Revenue Service requires the University to file information that includes a student's SSN and other information such as the amount paid for qualified tuition, related expenses, and interest on educational loans. This information is used to help determine whether a student, or a person claiming a student as a dependent, may take credit or deduction to reduce federal and/or state income taxes. Many efforts are made to protect the privacy of this number, and a student may request an alternate personal identifier. Further information may be obtained by contacting the Office of the Registrar.

Property Responsibility—The University is not responsible for the loss of personal property. A Lost and Found Office is maintained on campus in the University Police Office.

The Schools

ThesisSchools

COLUMBIAN COLLEGE OF ARTS AND SCIENCES

Dean W.J. Frawley
Associate Deans F.C. Arterton, P.B. Duff, D.L. Lipscomb, M. Moses
Assistant Deans K.Z. Keller, N. Mikhalevsky

The George Washington University awarded its first Doctor of Philosophy degree in 1888, one of the first institutions in the United States to do so. In 1892, the School of Graduate Studies was instituted. A number of organizational entities followed and, in 1965, after several decades of growth in a number of departments, the Graduate School of Arts and Sciences was established. All undergraduate and graduate education and research programs in the arts and sciences were combined in 1992 under one administration with the formation of the Columbian College and Graduate School of Arts and Sciences, now simply called Columbian College of Arts and Sciences.

All graduate programs in the arts and sciences, leading to the degrees of Master of Arts, Master of Fine Arts, Master of Forensic Sciences, Master of Public Administration, Master of Public Policy, Master of Science, Master of Philosophy, Doctor of Psychology, and Doctor of Philosophy, are administered by Columbian College. The faculty of Columbian College sets requirements for admission, provides courses and programs of advanced study and research, and establishes academic standards for its degrees.

Admission Requirements

A detailed description of the policies that follow is available at www.gwu.edu/~ccas. Applicants must hold an undergraduate degree from an accredited institution of higher learning. Applicants should have academic backgrounds of excellence, usually with majors, or equivalent, in the fields in which they intend to study for advanced degrees. Normally, a *B* average (or equivalent) from an accredited college is required. With evidence of special promise, such as high Graduate Record Examination scores, an applicant whose academic record falls short of a *B* average may be accepted on a conditional basis. Meeting the minimum requirements does not assure acceptance. The departments may, and often do, set higher admission standards. Moreover, the number of spaces available for new graduate students limits the number that can be accepted. Students who apply in their senior year must provide evidence of the completion of their baccalaureate work before registration in Columbian College is permitted. Applicants should be aware that graduate courses taken prior to admission while in nondegree status are not used in assessing admissibility to degree programs and may not be transferable into those programs.

With the exception of those applying to certificate programs and M.F.A. degree programs and those holding an earned J.D., M.D., or Ph.D., all applicants are required to submit scores on the GRE general test. In addition, some programs require scores on a GRE subject test (see the Columbian College section of the Graduate Admissions Application). The applicant must have the Educational Testing Service send the required score reports directly to Columbian College of Arts and Sciences. GRE scores are only valid for five years.

The following additional requirements pertain to all applicants from countries in which English is not the official language:

1. Applicants who do not hold a degree from a regionally accredited U.S. institution of higher learning are required to submit scores from the Test of English as a Foreign Language (TOEFL) or the academic International English Language Testing System (IELTS). The required minimum score is 550 (paper-based) or 213 (computer-based) on the TOEFL, or an overall band score of 6.0 on the academic IELTS with no individual band score below 5.0.

2. Applicants for graduate teaching assistantships must have a minimum score of 600 (paper-based) or 250 (computer-based) on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0.

3. Applicants admitted as degree candidates will be required to take the English as a Foreign Language Placement Test at The George Washington University before registering. Those who score 600 (paper-based) or 250 (computer-based) or more on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0, are exempted. Depending on the applicant's performance on the placement test, EFL course work may be required.

Application for Admission—Full information is available in the Graduate Admissions Application or see www.gwu.edu/~gradinfo.

Readmission—A student who wishes to resume a graduate program that had been interrupted must file an application form and provide supporting documentation to be considered for readmission. Readmission is not guaranteed, and the application is subject to review by the department concerned and the dean. The student may be required to take additional course work and qualifying examinations on the course work completed. Application forms are available from the CCAS Graduate Office or see www.gwu.edu/~gradinfo.

CCAS Regulations

CCAS provides an on-line Graduate Student Handbook (www.gwu.edu/~ccas/gstud.html) that contains additional updated information on the School's policies, regulations, and other matters of concern to enrolled or admitted students. It is the responsibility of the student to be aware of the information contained in both this Bulletin and the Handbook.

Grades

Information on grades and computing the grade-point average is found under University Regulations.

The symbol *I* (Incomplete) indicates that only a small portion of the required course work remains to be completed and that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work for a course. Conditional students may not receive a notation of *I*. The Incomplete must be made up before the lapse of one calendar year; the grade will be recorded as an *I* followed by the grade awarded on completion. An Incomplete that is not changed within one calendar year automatically becomes a grade of *IF* on the student's record. The symbol *I* cannot be removed by reregistering for the course here or by taking its equivalent elsewhere.

The symbol *IPG* (In Progress) is given for all thesis and dissertation research courses until the thesis or dissertation is completed. Upon the satisfactory completion of the thesis or dissertation, the symbol *IPG* is automatically changed to *CR* (Credit). *CR* may be indicated for Advanced Reading and Research courses and independent research courses.

Scholarship Requirements

Graduate students are required to maintain a minimum cumulative grade-point average of 3.0 (*B*) in all course work taken following admission to a graduate program in the College. Individual departments may require a higher average; the Department of English requires a 3.25 grade-point average for master's candidates and a 3.5 average for doctoral candidates. Only graduate course work that is taken at the University or through the Consortium and forms part of the student's departmentally approved program of studies may be included in the grade-point average. When a grade of *F* is received for a course, the grade is included in the student's grade-point average whether or not the course is repeated.

A student may repeat a course in which a grade of *C* or above was received only when permitted to do so by the department concerned, unless the course description states that the course may be repeated for credit. A written statement of permission must be submitted for approval to the CCAS Graduate Office by the appropriate departmental advisor. If a course is repeated, the first grade received remains on the student's record and is included in the student's grade-point average.

A graduate student may take an advanced undergraduate course (courses numbered 101–200) for graduate credit only upon the approval of the dean and the department at the time of registration. Such approval is granted only with the provision that the student complete additional work in order to receive graduate credit. No courses numbered 100 or below may be taken for graduate credit.

Program of Studies

The program of studies is a formal agreement between a student and a department of the requirements to be met in completing a specific degree program as well as the dates by which each requirement must be completed. Students should consult their department graduate advisor to outline their program of studies early in their program.

Students must make sure that they are fully informed of the requirements of Columbian College of Arts and Sciences as well as the requirements of their department or program. It is especially important for those admitted with conditions to consult with their departmental advisors as early as possible regarding completion of the additional requirements specified in the letter of admission.

Academic Work Load—Full-time students register for 9 to 12 credit hours each semester; part-time students must register for 3 credit hours each semester. These requirements do not apply to students who have fewer than 9 credit hours (full time) or 6 credit hours (part time) remaining to complete their programs. No more than 15 credit hours may be taken during any one semester. Students who are employed more than 20 hours per week are expected to apply for part-time academic programs and will not be permitted to register for more than 6 credit hours in any semester.

Continuing Research

All students must be continuously enrolled while working toward a degree, except during the summer sessions. (A few programs may require summer registration as well.) Students who have completed all course work and thesis or dissertation research requirements must register for CCAS 920 or 940, Continuing Research (1 credit), each semester until completion of the program. If continuous enrollment is not maintained, the student is dropped from the degree program unless a leave of absence is granted by the CCAS Graduate Office.

Leave of Absence

A student who, for personal reasons, is temporarily unable to continue the program of studies may request leave of absence for a specific period of time, not to exceed two semesters during the total period of degree candidacy. If the request is approved, the student must register for leave of absence each semester. If a student fails to register, degree candidacy is terminated.

Graduation Requirements

All students must file an Application for Graduation by the date indicated in the University Calendar for the semester or summer session in which they intend to graduate. Students must be registered in active status in the College during the semester or summer session in which they plan to graduate. Degrees are conferred in January, May, and August. Students who have completed the requirements for a degree but have not yet been awarded the degree will be issued

a letter to this effect upon request. A commencement ceremony is held annually in May.

Degrees

Listed below are the graduate degree programs of Columbian College of Arts and Sciences and the specific degrees offered, by field. The programs are directed by the departments concerned. Degree programs that bridge two or more departments are directed by committees composed of members of the departments concerned. For further information write to the chair of the appropriate department.

Graduate Fields

The graduate course work offered in support of the degree programs in the following list is shown by department in this Bulletin.

	Degrees Offered	
Humanities		
American Studies	M.A.	Ph.D.
Art History	M.A.	
Classical Acting	M.F.A.	
English	M.A.	Ph.D.
Fine Arts	M.F.A.	
Ceramics, Design, Interior Design, Painting, Photography		
Human Sciences		Ph.D.
Museum Studies	M.A.	
Theatre Design	M.F.A.	
Women's Studies	M.A.	
Social and Behavioral Sciences		
Anthropology	M.A.	
Art Therapy	M.A.	
Counseling*		Ph.D.
Criminal Justice	M.A.	
Economics	M.A.	Ph.D.
Geography	M.A.	
History	M.A.	Ph.D.
Human Resource Management	M.A.	
Legislative Affairs	M.A.	
Media and Public Affairs	M.A.	
Organizational Management	M.A.	
Political Management	M.A.	
Political Science	M.A.	Ph.D.
Professional Psychology		Psy.D.
Psychology		Ph.D.
Public Administration	M.P.A.	
Public Policy	M.P.P.	
Environmental and Resource Policy	M.A.	
Philosophy and Social Policy	M.A.	
Women's Studies	M.A.	
Public Policy and Administration		Ph.D.
Sociology	M.A.	
Speech–Language Pathology	M.A.	
Natural, Mathematical, and Biomedical Sciences		
Applied Mathematics	M.S.	
Biochemistry	M.S.	Ph.D.
Biological Sciences	M.S.	Ph.D.
Biostatistics	M.S.	Ph.D.

*In cooperation with the Graduate School of Education and Human Development.

Chemistry	M.S.	Ph.D.
Epidemiology	M.S.	Ph.D.
Forensic Sciences	M.F.S.	
Genetics	M.S.	Ph.D.
Genomics and Bioinformatics	M.S.	
Hominid Paleobiology	M.S.	Ph.D.
Immunology		Ph.D.
Mathematics	M.A.	Ph.D.
Molecular and Cellular Oncology		Ph.D.
Neuroscience		Ph.D.
Pharmacology		Ph.D.
Physics	M.A.	Ph.D.
Statistics	M.S.	Ph.D.

Requirements for the Degrees

The Master's Programs

Unless otherwise specified, the requirements listed below are applicable to candidates for all master's degrees offered by Columbian College of Arts and Sciences.

1. *General Requirements*—For a master's degree program including a thesis, the satisfactory completion of a minimum of 30 credit hours of approved graduate work, including 6 credit hours of thesis research, is required. For a master's degree program that does not include a thesis, the number of credit hours of approved graduate course work is determined by the department and normally consists of from 30 to 36 credit hours. The program without the thesis is not an individual student option and is not available in every department. Departments can and often do set requirements above the minimum required by Columbian College. Undergraduate courses taken to make up deficiencies are not counted toward program requirements.

Upon approval, up to one-half of the required graduate work may be taken in courses offered by another degree-granting division of this University. With approval, up to one-quarter of work toward a master's degree may be taken in courses offered by the other affiliated institutions of the Consortium of Universities of the Washington Metropolitan Area. In all cases, at least one-half of the hours counting toward the master's degree must be taken after entering the program, in courses offered by Columbian College of Arts and Sciences.

All master's degree candidates must complete degree requirements within four years. If supported by the department, extensions beyond this may be obtained in exceptional circumstances by petitioning the dean.

2. *Transfer of Credit*—A maximum of one-quarter of the credit hours of graduate course work required for a degree may be approved for transfer to a graduate program in Columbian College from enrollment at GW in nondegree status or from another degree-granting school of this University or another accredited college or university. For a transfer of credit to be approved, *all* of the following conditions must be met: the course work must be from an accredited institution and must have been taken within the two years prior to admission to the College, it must be approved by the department as part of the student's program of studies, it must not have been applied to the completion of requirements for another degree, it must be post-baccalaureate graduate-level course work, and the student must have received a grade of *B* or better in each course for which a transfer of credit is requested. This action must be requested in writing and approved by the departmental advisor and the dean. A transcript of the course work must be on file before the request can be considered.

Once enrolled in Columbian College of Arts and Sciences, students are not permitted to transfer course work taken outside the University, except under extraordinary circumstances.

3. *Special Program Requirements*—Certain programs require their degree candidates to demonstrate a reading knowledge of an appropriate foreign language or languages, a competence in quantitative methods, or some other such special subject requirements. Courses taken at the undergraduate level to fulfill these requirements may not be counted in the number of graduate credit hours required for these programs.

4. *Master's Comprehensive Examination*—Most programs require degree candidates to pass a Master's Comprehensive Examination in the major subject. Examinations are held on dates fixed by the departments. The nature and form of the examination are the responsibility of the department or program. A student who fails to pass the Master's Comprehensive Examination may, with the approval of the department, repeat the examination at the next scheduled examination date. If the student fails a second time, no further opportunity to take the examination is permitted, and the student's degree candidacy is terminated.

5. *The Thesis*—The main purposes of a master's thesis are to demonstrate the student's ability to make independent use of information and training and to furnish objective evidence of constructive powers in a chosen field. The student registers for 6 credit hours of thesis research. Registration for thesis research entitles the student to the advice and direction of the member of the faculty under whom the thesis is to be written. The thesis subject must be approved by the faculty member who will be directing the thesis. The thesis—in its final form, with one copy and a certificate of approval signed by the thesis director and by at least one departmental reader—must be presented to the dean no later than the date announced in the Graduate Student Handbook. All theses must meet the form, style, and other requirements set forth on line at www.gwu.edu/~ccas/thesis.html.

The Doctor of Philosophy Program

The Doctor of Philosophy program is divided into two parts: precandidacy and candidacy. During precandidacy, a student completes the general requirements and the General Examination. Upon satisfactory completion of the requirements associated with precandidacy, the student is considered by the department or program and the dean for admission to candidacy. During candidacy, the dissertation is prepared and defended in the Final Examination.

The minimum requirements are as follows:

1. *General Requirements*—The programs leading to the degree of Doctor of Philosophy require the satisfactory completion of a minimum of 72 credit hours of approved graduate course work, including at least 12 and at most 24 hours of dissertation research. A minimum of 48 of these hours must be taken in the precandidacy stage, in preparation for the General Examination. A maximum of one-sixth of these hours may be taken in courses offered by the other affiliated members of the Consortium of Washington Area Universities. The exact number of credit hours required for any part of the total program is assigned by each department and may exceed the minimum required by the Columbian College.

Ph.D. students have an overall eight-year time limit for completion of all degree requirements. If supported by the department, extensions beyond this time period may be granted in exceptional circumstances by petitioning the dean.

2. *Transfer of Credit*—Entering students who hold a master's degree relevant to the proposed doctoral field of study may request transfer of up to 24 hours of credit toward a doctoral degree for acceptable post-baccalaureate graduate work taken at the master's degree level at an accredited college or university. For those who do not hold the master's degree, a maximum of 24 hours of credit may be transferred, provided the conditions listed under The Master's Programs (Item 2) above are met.

3. *Special Program Requirements*—Certain programs require their degree candidates to demonstrate a reading knowledge of an appropriate foreign lan-

guage or languages, a competence in quantitative methods, or some other such special subject requirements. Courses taken at the undergraduate level to fulfill special program requirements may not be counted in the number of graduate credit hours required for the student's doctoral program, except that up to 6 hours of course work at the 100 level may be so counted, with the approval of the department. For further information on these and other regulations, consult the Graduate Student Handbook and the departments and programs concerned.

4. *The General Examination*—The General Examination is composed of a written examination in each of the areas of study comprising the student's total program.

A student who fails to pass any part of the General Examination may, with the approval of the department, repeat the examination at the next scheduled examination date. If the student fails a second time, no further opportunity to take the examination is permitted, and the student's degree candidacy is terminated.

Satisfactory performance on the General Examination is required for admission to candidacy but does not guarantee it. A department will recommend advancement to candidacy only if satisfied with the student's performance in every aspect of the program, only after a dissertation advisor has been selected and a dissertation area determined, and only if the department is confident of the student's ability to complete the dissertation within the allotted time.

5. *The Degree of Master of Philosophy*—Upon departmental recommendation and approval of the dean, the degree of Master of Philosophy may be awarded to students who have successfully completed all requirements for the Doctor of Philosophy degree up to and including the General Examination. Not all departments recommend students for this degree.

6. *The Dissertation and Final Examination*—A dissertation is required of each doctoral candidate as evidence of ability to perform scholarly research and interpret its results. The student normally enrolls for 12 to 24 hours of dissertation research after admission to candidacy. Dissertation Research must be taken in units of no less than 3 credits per semester.

When the dissertation has been approved by the director and the members of the Dissertation Research Committee, the candidate takes the Final Examination. A committee of examiners (composed of Columbian College faculty and outside scholars) conducts the examination. If the candidate passes, he or she is recommended to Columbian College for the degree of Doctor of Philosophy. The original and one copy of the dissertation in its final form, with the abstract, a certificate of approval signed by the department, and other required forms, must be submitted to the dean no later than the date announced in the Graduate Student Handbook.

Detailed information regarding regulations for the form and reproduction of the dissertation is available on line at www.gwu.edu/~ccas/thesis.html. The successful candidate for the doctorate is required, before receiving the degree, to pay a fee that is applied toward the expense of binding the two copies of the dissertation and microfilm service.

Doctor of Medicine/Doctor of Philosophy Dual Degree Program

A dual degree program is available to qualified students who seek both the Doctor of Medicine and Doctor of Philosophy degrees. The requirements that must be fulfilled for both degrees are identical to those currently and separately established in the School of Medicine and Health Sciences and Columbian College of Arts and Sciences.

A student working toward these degrees may apply a maximum of 24 credit hours of approved course work in the School of Medicine and Health Sciences toward the Doctor of Philosophy degree. The estimated time for the completion of this dual program is six years.

In order to enter the dual degree program, a prospective student must apply for and gain admission both to Columbian College and to the School of Medicine

and Health Sciences separately through established procedures. Upon admission to both schools, the student may then apply for affiliation with the dual degree program.

The Doctor of Psychology Program

1. *General Requirements*—The program leading to the degree of Doctor of Psychology requires the satisfactory completion of a minimum of 83 credit hours of approved graduate work. A maximum of 12 credit hours may be taken in courses offered by the other affiliated members of the Consortium of Universities. Doctor of Psychology degree candidates normally have an overall five-year time limit for completion of all requirements for the degree. If supported by the program, extensions beyond this time may be obtained in exceptional circumstances by petitioning the dean.

2. *Transfer of Credit*—Provisions are the same as those of the Doctor of Philosophy Program, above, except that up to 27 credits may be transferred into the program.

3. *The General Examination*—Each student is required to complete the General Examination no later than the beginning of the final semester of the program. A student who fails to pass any part of the General Examination may, in exceptional circumstances, and with the approval of the program, repeat the examination at the next scheduled examination date. If the student fails a second time, no further opportunity to take the examination is permitted, and the student's degree candidacy is terminated.

Further information on the requirements of the Doctor of Psychology degree appears under Professional Psychology in the Courses of Instruction.

Fellowships and Financial Aid

Many departments offer graduate teaching and research assistantships and fellowships; students should check with their department concerning funding opportunities. Graduate teaching assistants and University Fellows are appointed by the dean of the School, based on department recommendations. Other kinds of sponsored and University awards are also available. Awards are based on academic excellence, and only full-time graduate degree candidates in Columbian College are eligible to be considered. Doctoral candidates receive preference in the awarding of full graduate teaching assistantship/fellowship packages. Most appointments are made on a year-to-year basis and are not automatically renewable. Doctoral candidates may be funded for a maximum of six years, M.A. and M.S. candidates for a maximum of two years, and M.F.A. candidates for a maximum of three years. No student will receive more than six years of University support altogether.

Students applying for admission who also wish to apply for a fellowship should submit a completed application for admission by February 1. Students currently enrolled in the College should also submit the fellowship application to their department or program by February 1 and should check with their departments concerning additional application requirements. Filing the fellowship application entitles the student to consideration for all awards available in the student's department.

International students applying for teaching assistantships should refer to Financial Aid, International Students, for regulations governing the appointment of international graduate teaching assistants.

Students who wish to apply for loans should indicate their intent to do so on the Graduate Admissions Application. Information concerning loans is contained in a booklet available from the University's Office of Student Financial Assistance; an overview of funding opportunities is available from the University's Office of Fellowships and Graduate Student Support and at www.gwu.edu/~gradinfo.

Cooperative Programs

The American Studies Program at The George Washington University has a cooperative arrangement with the American Studies Program of the Smithsonian Institution. Members of the staffs of the Smithsonian's American Studies Program, National Museum of American History, National Portrait Gallery, and National Museum of American Art offer seminars and tutorial instruction in fields that provide students with an unusual opportunity to develop new dimensions in the discipline of American civilization. This program of study is open to students working toward the degrees of Master of Arts and Doctor of Philosophy and is intended to prepare them for research, teaching, and museum-related careers.

In the Department of Fine Arts and Art History, students in the Master of Arts in the field of art history with a concentration in museum training may take internships in the Corcoran Gallery of Art, the Freer Gallery, the Hirshhorn Museum and Sculpture Garden, the Museum of African Art, the National Museum of American Art, the Phillips Collection, the Renwick Gallery, and the Textile Museum.

The Museum Studies Program has forged strong relationships with more than forty local museums, historical houses, and government agencies. Each student is required to undertake 6 credit hours of internships—the equivalent of 520 hours of museum work. Most students elect to divide this requirement into two internships to maximize their exposure to different institutions and projects.

The George Washington University, in cooperation with two other universities and the Folger Shakespeare Library, helped establish the Folger Institute for Renaissance and 18th-Century Studies as a cooperative venture in graduate studies in the humanities. Fifteen universities are now member institutions. Seminars (limited to 12 students each) are offered each semester under the direction of American and foreign scholars. The Folger Library forms the core of the Institute. All participants enrolled in the seminars are granted access to the collections of rare books, manuscripts, and reference materials of the Library. All registered students are eligible to apply for admission to one or more of the seminars, although priority in enrollment will be accorded graduate students working on dissertations and postdoctoral scholars from the sponsoring institutions. Further information, including a listing of seminar topics, is available at the Folger Shakespeare Library.

Graduate Certificate Programs

A number of CCAS departments and programs offer graduate certificates. Check with the department or program concerned (indicated here in italics when different from the name of the certificate).

Art Therapy
Museum Studies
Political Management
Women's Studies
Leadership Coaching—*Organizational Sciences*
Organizational Management—*Organizational Sciences*
Survey Design and Data Analysis—*Statistics*
PACs and Political Management—*Political Management*

SCHOOL OF BUSINESS

Dean S. Phillips
Senior Associate Dean P.K. Bagchi
Associate Deans D.R. Sheldon, W.R. Baber

Organized as the School of Government in 1928, the School of Business has been responsible for over half a century for the professional development of individuals assuming leadership roles in society. The School comprises seven departments—Accountancy, Finance, International Business, Management Science, Marketing, Strategic Management and Public Policy, and Tourism and Hospitality Management. The use of a multidisciplinary approach in educational programming helps prepare both the generalist and specialist for professional careers in today's complex, organizational society.

The School of Business is a member of AACSB International–The Association to Advance Collegiate Schools of Business, and the undergraduate and graduate programs in business administration and accounting are accredited by the Association.

Vision—To be a preeminent business school recognized for scholarly research, teaching excellence, and innovative curricula focused on the responsible management of organizations in the global environment.

Mission—To deliver an outstanding education, advance knowledge, and provide practical experience in diverse organizational settings, leveraging the unique advantages of our location in the Washington, D.C., area, in order to enhance the capacities of students, faculty, staff, alumni, and the business community to be productive and principled members of society.

Values—Integrity: demanding transparency, accountability, and ethical behavior; leadership: encouraging problem solving, commitment, and entrepreneurship; scholarship: emphasizing discovery, learning, and innovation; service: responding to the needs of students, academic professions, and the community; relationships: fostering communication, collaboration, and collegiality.

Students from Other Schools Within the University—Degree candidates from other schools of the University cannot register for more than 12 hours of credit from the Master of Accountancy, Master of Science in Finance, or Master of Business Administration degree programs.

The Master's Degrees

Entrance Requirements

To be considered for admission, applicants must present a bachelor's degree from a regionally accredited college or university. Admission to master's programs is highly competitive. Previous academic history, performance on the applicable entrance examination, letters of reference, motivation and aptitude to do graduate-level work, and professional experience are all taken into consideration.

Applicants for admission to programs leading to the Master of Business Administration must submit scores on the Graduate Management Admission Test; applicants for admission to the Master of Accountancy, Master of Science in Finance, and Master of Tourism Administration degree programs must submit scores on the Graduate Management Admission Test or the Graduate Record Examination. Test scores that are more than five years old are not accepted for admissions review.

Additional Requirements for International Students—Students from countries where English is not an official language and non-native English speakers are required to take the Test of English as a Foreign Language (TOEFL) or the academic International English Language Testing System (IELTS). A minimum score

of 550 (paper-based) or 213 (computer-based) on the TOEFL, or an overall band score of 6.0 on the academic IELTS with no individual band score below 5.0, is required for consideration for admission for all degree programs with the following exceptions. The Full-time Master of Business Administration, the Professional Master of Business Administration, the Master of Science in Information Systems Technology, and the Master of Science in Project Management require a minimum TOEFL score of 600 (paper-based) or 250 (computer-based) and the Test of Written English (TWE), or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0. In some instances, an interview will be required of applicants. All international students coming from countries where English is not an official language and non-native English speakers must take the GW English as a Foreign Language Placement Test. Only those students who score 600 (paper-based) or 250 (computer-based) or higher on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0, will be exempted from this requirement.

Depending on the test results, the study of English as a Foreign Language may be required. The student may be restricted in the number and type of courses that can be taken. Students assigned English as a Foreign Language (EFL) courses should anticipate additional related tuition expenses as well as a possible extended period of time required to complete their degree program.

Transfer Within the School—Currently enrolled students wishing to transfer from one graduate degree program to another within the School must complete a new application for admission through the appropriate degree program office. Applicants for transfer are subject to requirements in effect at the time of transfer. In addition, students must submit all required credentials no later than the established completion dates for the term for which the transfer is requested. Students must be in good academic standing (3.0 grade-point average) for transfer consideration.

Readmission—A student who withdraws, is suspended, or is otherwise absent without authorization from the University for one semester or more must make formal application for readmission to the director of the student's degree program and resubmit all supporting credentials including transcripts from previous schools attended, including George Washington University, and entrance examination scores. If readmitted, the student is subject to the rules and regulations in force at the time of return. If the student has attended one or more regionally accredited colleges or universities during absence from the University, complete official transcripts must accompany the application for readmission.

The application fee is waived for a student applying for readmission who was registered as a degree candidate at the time of last registration at the University and has not since registered at another college or university.

General Requirements

All students must complete the prescribed minimum number of credit hours of graduate course work. A maximum of 6 credit hours of graduate course work may be approved for transfer to the School of Business from enrollment at GW in nondegree status or from another degree-granting school of this University, or another regionally accredited college or university under the following conditions: The course work must be approved as part of the student's program of studies; it must not have been applied to the completion of requirements for another degree, it must be at the graduate level, it must have been taken within the two years prior to acceptance into the program, and the student must have received a grade of *B* or better. A transcript and description of the course work must be on file before the petition can be considered. Should advanced standing be granted, the credit will count but not the grade.

Master's degrees are awarded by vote of the Faculty on completion of the required course work and completion of an acceptable thesis (if one is elected) in the chosen degree or field of concentration.

Courses numbered 101–200 may be counted toward the master's degree only when registration for graduate credit has been approved by petition at the time of registration by the director of the student's degree program. Written approval from the course instructor is also required. No work counted toward a bachelor's degree may be counted toward a master's degree; however, a student who has completed the equivalent of a Master of Accountancy or Master of Business Administration core prerequisite course with a grade of *B* or better as part of the bachelor's degree program may request a waiver of that course at the master's level. A grade of *B* or better is required to waive remaining core prerequisite courses on the basis of equivalent graduate-level courses completed at GW or another AACSB accredited college or university prior to admission to the program. All courses presented for waiver consideration must have been taken within five years prior to the first semester of enrollment into the program. Students should contact their degree program director for specific waiver criteria and deadlines for requesting waivers.

A full-time student may register for a minimum of 9 to a maximum of 15 credit hours each semester and 6 credit hours each summer session. Excluding those enrolled in the Professional Master of Business Administration, a graduate student who is employed more than 20 hours a week may not take more than 9 credit hours each semester and 3 credit hours each summer session. All work for a master's degree must be completed in five years.

Students who expect to continue studies for a doctoral degree after receiving the master's degree should ask for assistance in planning their programs of study.

No credit is granted for work done in absentia or without formal instruction, except for supervised field experience, independent study, and the thesis, which may be completed in absentia with the permission of the department, designated faculty advisor, or committee concerned.

Independent Study Plan—A graduate student of demonstrated capacity, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal direction of an instructor, in accordance with the rules of the appropriate department. Credit under this plan is limited to the specific credit hours normally allowed when a course is taken on a class basis. A petition outlining the student's specific study plan must be submitted to the student's degree program director prior to beginning any independent study. The student may petition to complete a maximum of two independent studies in two separate semesters.

Scholarship Requirements

The University's general scholarship requirements, including information on grades and computing the grade-point average, appear under University Regulations in this Bulletin.

A minimum grade-point average of 3.0 (*B*) must be maintained and is required for award of a graduate degree. All graduate courses and undergraduate courses taken for graduate credit after matriculation as a degree candidate (except those audited or taken for the grade of *CR*) will be used in the calculation of the grade-point average.

Probation—A student whose grade-point average falls below 3.0 at any point after completing 9 credit hours will be placed on probation. This probation extends through the period in which the student next attempts up to 12 credit hours of work, including prescribed courses. A student's program may be restricted by the program director if deemed necessary. During this period, the student's performance will be monitored to determine suitability for continued study. A student who fails to raise the cumulative grade-point average to 3.0 or

better during the period of probation will be suspended. Incomplete grades are not allowed during the probation period and are grounds for automatic suspension. A student who is subject to probation for a second time at any point during the program is automatically suspended.

Grade of F—A master's degree candidate who receives a grade of *F* is required to present cause, for consideration by the director of the student's degree program, as to why continued study should be permitted. Once a grade of *F* is earned in a core, required, or elective course, it remains a part of the student's permanent record and is calculated into the grade-point average. A master's degree candidate given the grade of *F* in a core or other required course, and permitted to continue in graduate studies, must repeat the course and achieve at least the grade of *B*. If the grade earned is below *B*, the student will be denied further registration as a degree candidate.

Suspension—A graduate student who does not meet the conditions of probation (see above) will be suspended. A student who is suspended or withdraws under these conditions may apply for readmission after the lapse of one semester. An outstanding Incomplete grade at the time of suspension will become an *F*. To be readmitted the student must submit evidence that indicates academic success if readmitted. A student so readmitted will continue on academic probation and must achieve a minimum grade-point average of 3.5 in the next 12 credit hours of graduate study. Should the student fail to achieve this minimum grade-point average, a second suspension will result and subsequent readmission will be denied.

Incompletes

Conditions under which the symbol *I* (Incomplete) may be assigned and changed are described under University Regulations.

The symbol *I* must be changed by a date agreed on by the instructor and the student but no later than the last day of the examination period for the fall or spring semester immediately following the semester or summer session in which the symbol *I* is assigned. An Incomplete that is not changed within this period automatically becomes an *IF*. In cases of well-documented extenuating circumstances, an instructor and a student may jointly petition the director of the student's degree program for additional time in which to complete the work of the course. Such petitions should be submitted within the same period. The symbol of *I* cannot be changed by reregistering for the course here or by taking its equivalent elsewhere, and remains on the student's permanent record even after the course has been successfully completed.

Thesis

Students contemplating doctoral study are strongly urged to include the thesis as an elective in their master's program. The thesis subject should be selected as early as possible to permit effective integration with the course work.

The subject must be approved by the professor in charge of the student's field. The thesis in its final form must have the approval of the professor in charge and must be presented to the dean by the student no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the semesters in which registered for thesis seminar (299) and/or thesis research (300), to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, additional time is granted. The student must, however, be enrolled continuously in the program. If the preparation of the thesis extends more than three semesters beyond the date registered for the-

sis research, the student must register for the entire required hours of thesis again and pay additional tuition.

Master of Accountancy

The Master of Accountancy program is designed to be flexible, allowing students to prepare for the fields of financial management, public accounting, and taxation. The program may be pursued on a full-time or part-time basis.

The program requires 30 to 37 credit hours. Accy 201 and 202 and MBAd 250 are required, but each may be waived on the basis of approved prior preparation with the substitution of another course. Econ 220 and MBAd 220 may each be waived on the same basis and do not require substitution of another course.

In addition, students who hold a B.Accy. take 12 credits within the Department of Accountancy and 12 credits within the School of Business (which may include courses in accountancy); students who do not hold a B.Accy. take 15 credits with the Department of Accountancy and 12 credits within the School of Business (which may include courses in accountancy).

Students who intend to take the C.P.A. examination should be aware that the course work required for admission to the examination varies from state to state. Students are advised to consult the Board of Accountancy for the state in which they plan to take the examination and choose electives that meet that state's requirements.

Master of Business Administration

The Master of Business Administration is designed to prepare students for careers in management and leadership positions in both the private and public sector. Students acquire a comprehensive foundation in the fundamentals of business, the global environment in which they will function, and the analytical tools for sound decision making. Students may apply to the Full-time M.B.A. program, the Professional M.B.A. program (part-time), or the Executive M.B.A. program, depending on academic and professional background. Separate application procedures and criteria exist for all programs. International students who must maintain full-time status for student visa requirements may apply only to the Full-time M.B.A. program and should see minimum TOEFL or IELTS requirements described under the School of Business entrance requirements. Requirements for both the Full-time and Professional M.B.A. programs are described immediately below. See www.gwu.edu\~business\emba for the Executive M.B.A. program, which is designed to meet the needs of middle- and senior-level executives and senior professionals. Changes to the Executive M.B.A. program are under development as this Bulletin is prepared for press.

Full-time Master of Business Administration

The full-time M.B.A. program is designed for individuals with a minimum of three years' work experience or those planning to take a career break to dedicate to a comprehensive one-and-one-half to two-year period of study. The program comprises 54 credits and additional required noncredit workshops in basic skills for managers. Students in the full-time M.B.A. develop expertise in a specific field of concentration or through an individualized field designed in consultation with a faculty member and approved by the director of the M.B.A. program. The student's concentration is complemented by a set of elective courses providing broad exposure to subjects and issues at the general management level or from other related program areas.

Waivers of up to 4 credits may be granted toward the completion of core requirements, reducing the program to the minimum residency of 50 credits. Waivers are specific by semester of study and are granted in consultation with the student's program coordinator.

The program consists of seven components.

1. *Basic Skills for Managers*—All full-time M.B.A. students must satisfy the program's basic skills requirements in finite mathematics and calculus for managers through required workshop attendance and/or proficiency examination prior to the first semester of study.

2. *Core Courses (18 credits)*—Econ 220; MBAd 205, 210, 220, 230, 231, 240, 250, 260. All core courses are 2 credits and are completed as a cohort during the first year of study. Any two of these courses may be satisfied by evidence of successful completion of comparable work at other accredited institutions, or by proficiency examination. Core courses may not be taken to satisfy either field of concentration or elective requirements. Only one core course may be waived in each semester of the program's first year.

3. *Integrative Courses (4 credits)*—MBAd 211, 221. These courses are delivered as part of the first-year cohort experience, with the core. Each course is 2 credits. Integrative courses may not be taken to satisfy either field of concentration or elective requirements.

4. *GLOBE Program (2 credits)*—MBAd 201. The GLOBE (Global Leadership of Business Enterprise) requirement is a series of workshops in communications for managers and team building, seminars, and company visits integrated into the core curriculum and offered as part of the first-year cohort experience. Topics include business ethics, cross-cultural management, career development, total quality management, and site visits to companies and agencies in the Washington metropolitan area. MBAd 201 may not be waived.

5. *Capstone Course (3 credits)*—MBAd 270, Strategy Formulation and Implementation, is the culminating course that ties together the core curriculum; it includes the MBA intramural case competition and may not be waived. MBAd 270 must be taken in the first semester immediately following the completion of core and integrative course requirements.

6. *Concentration Courses (12 credits)*—These courses give students depth of understanding in a selected field. Courses are selected in consultation with faculty advisors and program coordinators and may be tailored to individual interests. The following fields of concentration are available: accountancy; environmental policy and management; finance and investments; health services administration; human resources management; information systems management; international business; management decision making; management of science, technology, and innovation; marketing; nonprofit organization management; organizational behavior and development; real estate and urban development; small business/entrepreneurship; strategic management and public policy; supply chain management; tourism and hospitality management.

7. *Elective Courses (15 credits)*—Students may select any graduate-level courses to satisfy this requirement after consultation and approval of faculty advisors and program coordinators. Electives can include no more than one course in the student's selected field of concentration and must include one course with a global focus related to the field. Students are required to select an M.B.A. consulting practicum course or international internship/project experience course as one of their electives.

Professional Master of Business Administration

The Professional M.B.A. program is designed to provide the highest quality educational experience to part-time students who are currently holding full-time professional positions. The curriculum incorporates consistent emphasis on application of concepts and analytical tools to current management problems. There is a focus on teamwork and communication skills in team projects with an emphasis on real-world mix of private and public sector issues.

The program comprises 48 credits. If equivalent course work was successfully completed within five years, waivers without substitution may be granted for up to four core courses (8 credits), reducing the program to the minimum residency of 40 credits. Waivers may be allowed for an additional five core or integrative

courses with substitution of second-level electives, although such substituted courses do not apply to the required 24 credits of elective courses. All core courses are eligible for waiver consideration. Proficiency tests are offered for the waiving of MBAd 210, 211, 220, 221, 231, and 250.

The program consists of three components:

1. *Core Courses (18 credits)*—Econ 220; MBAd 205, 210, 220, 230, 231, 240, 250, 260. All core courses are 2 credits. Core courses may not be taken to satisfy elective courses.

2. *Integrative Courses (6 credits)*—MBAd 211, 221, 271. All integrative courses are 2 credits. Integrative courses may not be taken to satisfy elective courses.

3. *Elective Courses (24 credits)*—Students may select any graduate-level courses to satisfy this requirement after consultation and approval of faculty advisors and program coordinators. While there are no fields of concentration for the Professional M.B.A., elective courses may be selected from fields of concentration in the School of Business.

The program has two delivery options:

Accelerated cohort schedule—offered off-campus at GW's Professional Education Center in downtown Washington and at the Alexandria Graduate Education Center in Virginia. The accelerated cohort is designed for fully employed, mid-level managers with at least three years of professional experience who seek an intense graduate education while continuing to work full time. In addition to the general entrance requirements, a personal interview is required of candidates for the accelerated cohort. Waivers of core and integrative courses are limited to one per semester in the accelerated cohort.

The accelerated format includes one weekend residency prior to the first semester, followed by an intense schedule of core and integrative courses scheduled one evening per week and Saturday mornings, to be completed in three consecutive semesters as a cohort class; then students select their electives to complete the degree requirements in the next three semesters.

Flexible schedule—offered at GW's main campus. The flexible delivery option is designed for fully employed, mid-level managers with at least three years of experience who seek a flexible, self-paced graduate education while continuing to work full time. In addition to general entrance requirements, a personal interview is recommended. Accepted students may begin the program in the fall or spring semester and register for one or more courses each semester, as appropriate, to complete their degree requirements. Students have up to five years to complete their program on a self-paced schedule.

Master of Science in Finance

The Master of Science in Finance degree is designed to prepare students with specific career interests in the areas of financial management and research. The program of study leading to the Master of Science in Finance emphasizes the theoretical foundations of finance and quantitative methods in financial management. Students will be engaged in applied research and modeling using a variety of data sets and computer software packages. The curriculum provides in-depth study of the international and federal government regulatory dimensions of finance.

The Master of Science in Finance program consists of 48 credit hours of course work: Fina 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282. In addition, 6 credit hours each in calculus and economics and 3 credit hours each in financial accounting, managerial finance, and statistics are prerequisite.

The Master of Science in Finance is designed to be completed in either 12 months of full-time study including a summer session or 24 months of part-time study including two summer sessions. Students with very strong backgrounds in a particular subject area can petition to waive up to 8 credits of required courses to be replaced by electives as approved by the program director.

Master of Science in Information Systems Technology

The Master of Science in Information Systems Technology is designed to provide students depth of understanding in a selected major field. The program offers four fields of concentration: information systems development, information systems project management, management information systems, and business technologies. Students have the option of combining two of these major fields within the program. In addition to the fields listed here, the Executive Master of Science in Information Systems Technology is offered on the Virginia Campus (see the Virginia Campus section under Courses of Instruction for more details).

Applicants with deficiencies in preparation may be required to take prescribed background courses, remedial workshops, or other forms of preparation before beginning course work in the program. Although scores are not required, applicants who have not previously demonstrated strong academic performance in a related field should submit GRE or GMAT examination scores as additional evidence of their capability to perform competitively at the graduate level.

The program consists of 30 to 33 credit hours of graduate course work.

Information systems development—Mgt 280, 282, 284, 287, four technical electives chosen from other M.S.I.S.T. courses, and two 3-credit general electives.

Information systems project management—Mgt 210, 215, 224, 230, 231, 280, 282, 284, 287, two technical electives chosen from other M.S.I.S.T. courses.

Management information systems—Mgt 201, 226, 231, 271, 280, 282, 284, 287; and two 3-credit electives chosen from Mgt 220, 224, 241, 272, 273, 274, or other courses specified by the advisor.

Business technologies—Mgt 248, 282, 283, 284, 285, 287, 289, and three approved Special Topics courses.

Master of Science in Project Management

The Master of Science in Project Management degree program is designed for professionals who want to enhance their ability to motivate people, integrate complex projects, and achieve cost-effective results. The curriculum focuses on traditional and modern techniques of managing projects in areas that range from new product development to mergers and acquisitions. The degree program is offered both on campus by distance learning.

The program consists of 36 credit hours of graduate course work. The required courses are Accy 201; Mgt 201, 202, 215, 224, 231, 267, 268, and two specified offerings of 290; the remainder of the program consists of School of Business electives approved by the advisor.

Master of Tourism Administration

The Master of Tourism Administration degree program is designed to prepare students for career entry or mid-level management positions in public, commercial, or nonprofit organizations providing visitor services at the local, national, or international level. Students have opportunities to learn from culturally diverse colleagues and from a wide range of visitor-service organizations, as well as from the classroom. Students may choose one of the three formal concentration areas below or may develop an individualized studies program in an area such as international hotel and resort management, airline management, heritage tourism management, or ecotourism. The degree program is offered both on campus and by distance learning.

The program consists of 36 credit hours of course work consisting of four core courses (TStd 249, 251, 270, 296), courses in the field of concentration as outlined below, electives, and two capstone courses (either TStd 283 and 297 or TStd 299 and 300).

Sustainable destination management: TStd 260, 261, 262, 263.
Event and meeting management: TStd 263, 266, 277, 278.
Sport management: TStd 264, 265, 266, 277.
Individualized studies: The student designs a plan of study and provides a brief justification specifying the courses to be taken, and submits it by petition through the faculty advisor.

Doctoral Program

The degree of Doctor of Philosophy is offered in accountancy, business administration, and management and technology. The Committee on Doctoral Studies supervises all aspects of the program.

The minimum admission requirement is a bachelor's degree from a regionally accredited college or university, preferably with a major appropriate to the proposed field of study. Most applicants have completed a master's degree in an appropriate field. Applicants whose degrees are in fields other than their proposed field of study are expected to obtain the necessary background either before or soon after admission to the program. Scores on the Graduate Record Examination or the Graduate Management Admission Test are required: Scores may not be more than five years old. Arrangements to take the tests must be made with the Educational Testing Service. Students whose native language is not English must also submit Test of English as a Foreign Language (TOEFL) scores of 600 or better (paper-based) or 250 or better (computer-based). The Doctoral Committee does not use specific cutoff points for grade averages and test scores. It carefully reviews each applicant's entire record and makes its selection on a competitive basis in keeping with enrollment limitations.

The doctoral program consists of two major parts: the pre-dissertation stage and the dissertation stage. The objective of the pre-dissertation stage is to provide the student with the theoretical foundations and practices of the primary and supporting fields of study and with a command of the relevant qualitative or quantitative methods of research and analysis. The objective of the dissertation stage is to have the student apply the obtained theoretical and practical knowledge and analytical methods to the resolution of a research problem. The research should be original and is expected to result in a contribution, either applied or theoretical, to the existing body of knowledge.

All course work, other educational activities, and required comprehensive evaluations in primary and supporting fields must be completed within five years of matriculation. The total program must be finished in seven years. If a student is granted an extension beyond the seventh year (14 semesters), the student must register and pay for 3 credit hours of Dissertation Research at the then-current tuition rate every semester until graduation.

The pre-dissertation stage is based on an individual study plan developed by the student under the guidance of the primary and supporting field advisors during the first academic year. In the study plan the student must state long-range professional objectives, all proposed academic activities, methods of evaluation, and a semester-by-semester schedule.

All students, regardless of the primary field of study, must include in their study plan Mgt 390, Philosophical Foundations of Administrative Research, and the multidepartmental course 311, Seminar: Public–Private Sector Institutions and Relationships. These courses must be taken during the first academic year after admission. PAd 395, Research Methods, must be taken within the first two academic years. Mgt 391, Advanced Problems of Research Methodology, must be taken at the end of course work.

In addition to the evaluation methods proposed in the study plan, a comprehensive evaluation of study plan activities for both the primary and supporting fields is the final process of the pre-dissertation stage.

As background, a student whose field is designated as Business Administration must demonstrate, either through prior academic experience or through the proposed content of the doctoral study plan, a working knowledge of the principal content areas of business administration.

Supporting fields may be chosen from other departments of the University. A student selecting a field outside of the School, however, must meet the academic and administrative requirements of the department involved.

For more detailed information on the program and its administration, see the Handbook on the Doctoral Program, available in the Doctoral Program Office.

Special Programs

Executive Master of Business Administration

The Executive Master of Business Administration program is designed to meet the needs of mid- and senior-level managers and professionals without career interruption. The program focuses on executive decision making with emphasis on global and technology-based organizations. See www.gwu.edu\~business\emba.

Executive Master of Science in Information Systems Technology

The Executive Master of Science in Information Systems Technology is a weekend-oriented program for participants representing a broad spectrum of public and private organizations. The program equips participants with the tools necessary to manage the diverse processes of the development and application of information technology to effectively meet the needs of the modern organization. See the Virginia Campus section under Courses of Instruction.

Joint Degree Programs

Students may work concurrently toward both the Juris Doctor degree in the GW Law School and the Master of Business Administration in the School of Business. In consultation with their faculty advisors, students in these programs may transfer up to 14 credits of Law School course work to their M.B.A. program and 12 credits of School of Business course work to fulfill requirements for the J.D. Students must be admitted separately both to the Law School and to the School of Business and must meet all requirements in each degree program prior to receiving either diploma. It is possible for a student to complete work for both degree programs within four years.

In addition, a joint degree program is offered with the Elliott School of International Affairs. The joint Master of Business Administration and Master of Arts is available to students who plan to pursue a field of study in international business. The program consists of a minimum of 66 credit hours of course work. Students must be admitted separately both to the School of Business and to the Elliott School of International Affairs and must meet all requirements for each program prior to receiving either diploma.

School of Business Post-Master's Graduate Certificate

The School of Business Post-Master's Graduate Certificate is designed to provide School of Business master's degree alumni an opportunity to build upon their previous graduate study to keep pace with today's business climate. Program participants may undertake a program of study in an existing School of Business field or from a series of specially designed program offerings. Further information is available from the Office of the Dean.

GRADUATE SCHOOL OF EDUCATION AND HUMAN DEVELOPMENT

Dean M.H. Futrell
Associate Deans J.C. Heddesheimer, R.N. Ianacone, J. Gomez (*Interim*)

The Graduate School of Education and Human Development prepares teachers, human resource leaders, counselors, and administrators for professional service. The School also offers opportunities to experienced professionals to extend and enrich their education. The programs are designed to meet the broad needs of persons who seek knowledge and skills necessary to provide effective learning and teaching, research, services, and leadership in a variety of settings that cover the entire life span.

The Graduate School of Education and Human Development is the administrative unit for three departments: Counseling/Human and Organizational Studies, Educational Leadership, and Teacher Preparation and Special Education. In addition to programs of study leading to its degrees, the School offers credit and noncredit workshops designed to meet the unique needs of metropolitan area school systems and other clientele in industry and government.

Special curricula are individually tailored for liberal arts graduates and graduates of other professional schools who are interested in teaching or in other human services areas. The School also offers a wide range of courses for teachers who wish to pursue advanced studies and additional endorsements and for provisional teachers who wish to prepare for teaching certificates.

Laboratory and clinical facilities are provided by the Community Counseling Service Center and Office of Laboratory Experiences, which are responsible for internship placements in the community. Field experiences are provided in cooperation with public and private schools, social and health agencies, museums, institutions in the business community, community and junior colleges, and the federal government. Some programs and courses are also offered at off-campus locations or via distance learning.

Mission Statement—The Graduate School of Education and Human Development at The George Washington University is committed to providing the highest quality of educational services to its students. We develop innovative research programs, contribute in diverse ways to local communities and the nation, and actively participate in the international community scholarship. Our location in the nation's capital, a vibrant multicultural and multinational center, offers a broad range of resources and opportunities to our diverse students and faculty. We believe that continuous self-examination and improvement are fundamental to the education and human development professions.

Bridging Concepts—The following bridging concepts are central to the unified conceptual framework of the School and weave through the mission, goals, and initiatives of its strategic plan.

Research and scholarship are prerequisite to the improvement of educational practice.

Leadership is critical in the reform and redesign of education and human service at all levels.

Building reflective practitioners through integration of theory and practice must be a focus of all programs.

A community of diverse learners is prerequisite to success in the education and human service professions.

Teacher Certification Preparation Programs

Programs are available to prepare students for teacher licensure in elementary, secondary, and special education through the Master of Arts in Education and Human Development, Master of Education, and Education Specialist degree programs. Students who plan to prepare for licensure must apply to the appro-

priate degree program. These degree programs are also available to credentialed teachers seeking second endorsements.

In accordance with the 1998 Amendments to the Higher Education Act, Title II, Section 207, The George Washington University Graduate School of Education and Human Development provides required information in response to any request by potential applicants, guidance counselors, and prospective employers. An information sheet is included with all distributed materials and can also be viewed on the Web at gsehd.gwu.edu/gsehd.

GSEHD Regulations

Grades

Information on grades and computing the grade-point average is found under University Regulations.

The symbol *I* (Incomplete) indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. A grade of *I* remains on a student's record for one calendar year; if work for the course is not completed within the calendar year, the grade converts to *IF*. If the work is completed within the designated time period and a grade is assigned, the grade is indicated in the form of *I*, followed by the grade. The indication of *I* cannot be removed from the transcript.

Scholarship

A grade-point average of 3.0 is required for graduation. Students who receive a grade of *C* in more than 6 credit hours are subject to suspension. Students who receive a grade of *F* must confer with the dean before enrollment for further course work is allowed. More detailed information for doctoral students can be found in the Doctoral Student Handbook.

Continuous Enrollment and Maintaining Residence

Students must be continuously enrolled in GSEHD unless the dean grants a leave of absence. Failure to register each semester of the academic year will result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the School. See Continuous Enrollment Status under University Regulations.

When master's degree candidates are sitting for a comprehensive examination and are not otherwise enrolled in course work, they may prepare for and sit for the exam in continuous enrollment status. All doctoral students and those master's students who elect to take an additional semester to prepare for the examination or who must retake the examination are required to sign up for the examination preparation course, which carries a fee equivalent to 1 credit hour of tuition. See Master's Comprehensive Examination, below.

Leave of Absence

Students who, for personal reasons, are temporarily unable to continue their program of studies may request a leave of absence for a specific period of time not to exceed one calendar year during the total period of degree candidacy. If the request is approved, the student must register for leave of absence each semester. If a student fails to register, degree candidacy is terminated. After reaching the one calendar year limit, students who are requesting to register in leave of absence status for additional semesters must seek approval for further time in this status from the appropriate appeals committee.

PRAXIS Teacher Assessments

All degree programs preparing students for teacher licensure require completion of the Educational Testing Service PRAXIS teacher assessments as

specified by the District of Columbia Public Schools, Educational Credentialing and Standards Branch. A passing score on PRAXIS I is a requirement for admission to all initial licensure programs.

International Students

In addition to all listed criteria for admissions, students from countries where English is not an official language are required to take the Test of English as a Foreign Language (TOEFL) or the academic International English Language Testing System (IELTS). A minimum score of 550 (paper-based) or 213 (computer-based) on the TOEFL, or an overall band score of 6.0 on the academic IELTS with no individual band score below 5.0, is required for consideration for admission. All international students coming from countries where English is not an official language must take the GW English as a Foreign Language Placement Test. Only those students who score 600 (paper-based) or 250 (computer-based) or higher on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0, will be exempted from this requirement.

Depending on the test results, the student may be restricted in the number and type of courses that can be taken. Students assigned English as a Foreign Language (EFL) courses should anticipate additional related tuition expenses as well as a possible extended period of time required to complete their degree program.

The Degree of Master of Arts in Teaching in the Field of Museum Education

The Graduate School of Education and Human Development offers an intensive interdisciplinary program in museum education. The program is designed to prepare graduates for work fulfilling the educational mission of art, history, or science museums; zoos, aquaria, or nature centers; and historical societies or sites. Graduates also qualify to serve as liaisons between schools and museums and as professionals in museum-related private and public agencies.

Those interested in museum studies more generally should refer to Museum Studies under Courses of Instruction.

Admission Requirements

To be admitted to the program in museum education an applicant must have a bachelor's degree from an accredited institution; present a statement of purpose and two written references attesting to quality of academic record and work experience; submit scores on either the Graduate Record Examination or the Miller Analogies Test and transcripts from each institution attended; and be interviewed by the Selection Committee or make alternative arrangements specified by the Committee. A desire to broaden the museum audience and an interest in human development and learning are essential. Evidence of strong undergraduate, graduate, or professional experience in such fields as American studies, anthropology, art history, fine arts, history, or the biological, physical, or social sciences is desirable.

Plan of Study

All degree candidates take six sequential core courses in four successive semesters beginning in June and ending in July of the following year. Each student also pursues three elective courses in a chosen museum-related academic discipline, museology, or education. Two carefully supervised field placements provide direct museum education experience. In the fall semester, students serve two days a week as museum resource specialists in an educational site. In the spring semester, students hold four-day-a-week internships in a museum or museum-related organization. The program requires completion of 33 credit hours.

The Degree of Master of Education

Elementary Education—The Master of Education in the field of elementary education is designed for those with an undergraduate degree in the arts and sciences. The 39-credit-hour program includes course work for students who wish to become eligible for licensure/certification for teaching at the elementary school level (grades 1–6); additional course work in content areas may be needed to meet specific jurisdictional requirements for licensure/certification.

Secondary Education—The Master of Education in the field of secondary education is designed for those with an undergraduate degree in the arts and sciences. Students are expected to have had substantial course work in an academic field taught in secondary schools. Degree candidates may specialize in art, computer science, English, English as a second language, foreign languages, mathematics, science, or social studies. The minimum 36-credit-hour program includes the course work leading to eligibility for teacher licensure/certification; specific course work in the subject area to be taught may be needed to meet jurisdictional requirements for licensure/certification.

The Degree of Master of Arts in Education and Human Development

The degree programs leading to the Master of Arts in Education and Human Development are designed to provide students with specialized knowledge and skills required for advanced professional competence in a variety of educational, human development, and service industry careers. Each program of study involves a combination of classroom and field-based learning experiences tailored to a professional specialty and individual student needs. Students engage in a wide range of teaching and research approaches that reflect the School's commitment to excellence in professional education.

The diversity of master's programs in the Graduate School of Education and Human Development reflects its belief that education and human development comprise a multifaceted enterprise reaching persons of all ages in a variety of settings. These programs develop professional knowledge, skills, and attitudes that will enable graduates to foster learning, growth, and development in individuals throughout society. Depending on the program specialty, students are prepared to pursue careers in schools, universities, community-based and human service organizations, cultural and leisure institutions, and business and government settings.

Master's programs are available in the fields listed on the following pages.

Counseling—The master's programs in counseling are designed to provide three specialty concentrations and one subspecialty concentration for entry-level positions in professional counseling. Program graduates are prepared to specialize in a specific field and to work in a variety of settings in which professional counseling is offered. All counseling concentrations require the equivalent of two full years of study and provide core learning experiences that combine professional and behavioral studies with supervised laboratory, practicum, and internship experiences. Some programs have specific prerequisites in addition to the general admissions requirements. The master's programs in school counseling and community counseling and the doctoral program in counseling are accredited by the Council for the Accreditation of Counseling and Related Educational Programs. The master's program in rehabilitation counseling is accredited by the Council on Rehabilitation Education.

Students who successfully complete a graduate program in counseling are eligible to apply for certification by the National Board of Certified Counselors. Students who successfully complete the graduate program in rehabilitation counseling are eligible to apply for certification by the Commission on Rehabilitation Counselor Certification. State licensure and certification are available in most states, and requirements vary by state.

The core course of studies for all program concentrations includes course work in the foundations of counseling, human behavior and development, professional ethics, mental health problems, testing and assessment, career development, individual and group counseling, cross-cultural counseling, and research and statistics.

Community Counseling—This 48-credit-hour program prepares graduates to enter the counseling profession in a variety of human service settings, including welfare and other social service agencies, mental health centers, penal institutions, court systems, employment centers, allied health agencies, government service agencies, community college counseling centers, employee assistance programs, and private practice. A subspecialty in employee assistance counseling is available to prepare counselors for business, industry, and government settings.

School Counseling—This 48-credit-hour program provides professional preparation for individuals to become certified as counselors in public and private schools. The program is designed to provide students with the requisite knowledge and skills to provide professional counseling, assessment, consultation, and guidance services in a school setting.

Rehabilitation Counseling—This 48-credit-hour program prepares rehabilitation counselors to help persons with emotional, mental, and physical disabilities to live independently or return to work. The rehabilitation counselor works jointly with the consumer of rehabilitation services to make vocational and independent living choices and plans. In an accelerated program, persons with an undergraduate degree in human services/rehabilitation services can complete this program with a minimum of 42 credit hours.

Curriculum and Instruction—This program prepares teachers and other educational personnel for increased responsibilities in the planning, implementation, research, and evaluation of curriculum and instruction.

A minimum 36-credit-hour program includes study in curriculum development, research and evaluation of instructional practice, teacher education, work with special populations, and school policy and leadership. A program specialization may include advanced study in elementary education, a content area of secondary education, special education, or bilingual special education. The National Board for Professional Teaching Standards core propositions are integrated throughout all areas of study. An internship is required.

Education Policy Studies—The program is designed for students who wish to develop skills in policy research, program evaluation, and the technical, political, and managerial aspects of education policy. Emphasis is placed on developing both an understanding of the political and social environments affecting education policy and the competencies needed to develop policy options, analyze their potential, select the most promising, implement policies effectively, and evaluate impacts. Internships are offered in a variety of federal, state, and local agencies.

The 36-credit-hour program includes 12 elective credits that can be used for courses, independent research, and internships in federal, state, or professional organizations.

Educational Leadership and Administration—This program prepares students for various school-based and central office leadership positions, for supervisory positions, and for increased responsibility in teaching. The program is designed to prepare graduates for advanced levels of professional responsibility in diverse school communities and to increase their technical, conceptual, political, and leadership skills. Emphasis is on leadership and management, change, communication, organizational learning, administrative and legal issues, human relations, human resource development, general supervisory principles and responsibilities, and supervision of instruction.

The 33-credit-hour program includes courses and field experiences designed to meet administrative certification requirements in the District of Columbia, Maryland, Virginia, and some other states. Candidates must have three years of successful teaching experience.

Educational Technology Leadership—This program is designed for persons who are entering or advancing in positions associated with schools, higher education, alternative educational settings, or other human service occupations in which computers and related information delivery technologies are used. The program of studies provides students with opportunities to develop the knowledge, understanding, and skills necessary to provide leadership in the rapidly changing environment of technology in education.

The 36-hour program includes required course work in the theory and practice of educational technology, including the use of computers and other instructional technology systems, technological management systems, policy-making, research methods, and leadership. The pioneering program is delivered via interactive distance education to students around the world. Nine hours of the program are specialization electives, which can be chosen, with the advisor's consent, from other departments in the University.

Higher Education Administration—This program prepares students for administrative positions in institutions of higher education, associations, national and international government agencies, and business and industry related to education. The program is designed so that a student may select a concentration in general administration, student affairs administration, higher education policy, international higher education, college teaching and academic leadership, and higher education finance. The course of study is organized in five parts: (1) an introduction to the world of higher education (how U.S. higher education evolved, the breadth of the U.S. system of higher education, and the administrative and governance structure of U.S. colleges and universities); (2) research design and analysis; (3) the concentration (in-depth focus on a particular aspect of higher education and its administration); (4) application electives (including internships and practica); and (5) leadership integration. All concentrations require a 33-credit (with comprehensive examination) or 36-credit (without comprehensive examination) program.

Human Resource Development—This program is designed for persons entering or advancing in positions associated with learning in organizational settings in all sectors of society. Typical careers are in organizational development, internal and external consulting, and training and development. The program is interdisciplinary, and students are encouraged to tailor their programs to individual career needs and objectives.

The eight required courses in the 36-credit-hour program include foundations and issues of human resource development, adult learning, group dynamics, research methods, organizational diagnosis, and either strategic human resource development or assessing the impact of human resource development efforts. Fieldwork in cooperating Washington-area business, industry, government, and community organizations may be a part of the learning experience.

Individualized Program—This program provides the opportunity to develop an individualized curriculum that cuts across existing fields, both within the Graduate School of Education and Human Development and between the School and other schools and departments of the University and the Consortium. The program is designed to meet specific career and professional objectives of applicants who have unique needs. The flexible program structure can be tailored to prepare for new and emerging fields in education and human development.

This 36-credit-hour program is available within or across the three departments of the Graduate School of Education and Human Development. The pro-

gram must contain a 12-credit-hour core curriculum consisting of courses in human development, social/historical/philosophical foundations in education, and curriculum. The remaining 24 credit hours must correspond directly to the program objectives and bear a direct relationship to each of the areas identified above. A minimum of 6 credit hours of fieldwork, or the equivalent, must be a part of the program. All work toward the degree must be specified at the time the initial program is developed.

International Education—This program is designed for persons who are entering or advancing in positions associated with training, education, adult learning, and development activities in diverse settings that require international understanding. The program aims toward preparation of leaders to bring about improvements in developing education systems. Students acquire knowledge of other countries and cultures, using the education system as a means of interpreting and translating knowledge across cultures and analysis of the formal and nonformal school systems as they reflect history, culture, development, values, contemporary concerns, and future trends. In addition, students acquire tools, methods, and habits of analysis that enable them to play a variety of roles as leaders and change agents.

The program, which requires a minimum of 33 credit hours, allows a selection from a variety of subspecialization areas. A minimum of 15 credit hours is required in the international education studies area. A 9-credit subspecialty complements the major area of study and may be taken in any division of the University. Up to 6 additional credit hours of internship may be required for students who do not have international education related experience.

Special Education—The master's programs in special education provide core and specialty studies and field experiences designed to prepare highly competent and committed professionals for a broad range of educational and leadership roles in the field of special education and related services.

Infant Special Education—This program is designed to prepare professionals to serve the needs of infants and toddlers with, or at risk for, disabilities and their families. The course of study prepares students to perform direct service and administrative, consultative, and research roles in health care, human services, and educational settings. Internships in specialization areas include hospital-based programs, infant intervention settings, developmental assessment clinics, inclusive day-care centers, and Early Head Start.

The 39-credit-hour program includes courses in infant development and assessment, neurodevelopmental assessment and programming, family systems intervention, behavior management, and law and policy. A practicum and internship are required.

Early Childhood Special Education—This program prepares educators in the areas of development of young children evidencing developmental delay, identification and assessment procedures, and clinical teaching and alternative models of service for children with, or at risk for, disabilities. The program prepares students for interdisciplinary work with children from ages three to eight.

The 39-credit-hour program includes courses in language development, typical and atypical development, formal assessment, interdisciplinary theory, family intervention skills, behavior management, and legal and policy concerns. A practicum and internship are required.

Special Education for Children with Emotional and Behavioral Disabilities—This 39-credit-hour program of study requires a two-semester clinical internship at an elementary and middle school serving children with emotional and behavioral disabilities. Students are involved in course work and clinical experiences with professionals from various allied mental health fields. The program is designed to develop competencies in the nature and needs of troubled children; assessment, programming, and teaching; and working effectively as an interdisciplinary and interagency team member. The program provides eligibility

for licensure certification in the area of emotional disturbance; it is available to full-time students only and can be completed in one calendar year.

Special Education for Adolescents with Emotional and Behavioral Disabilities—This part-time, 42-credit-hour program of study typically requires two academic years and three summers to complete. The program provides eligibility for licensure certification in the area of emotional disturbance; it is multidisciplinary in concept and design. Students are involved in course work and clinical experiences with professionals from various allied mental health fields. The program is designed to develop competencies in the nature and needs of adolescents with serious emotional disturbance; assessment, programming, and teaching; functioning effectively as an interdisciplinary team member; and providing consultation to administrators and teachers in regular education on inclusion.

Transition Special Education—This interdisciplinary program prepares educators and support personnel to address the needs of youth and young adults with special needs for careers and transition from school to postsecondary education, employment, and independent self-adjustment. Teacher licensure certification preparation in categorical learning disabilities or noncategorical special education is available through the program. The curriculum integrates the roles of relevant disciplines and service agencies, including postsecondary planning, alternative service models, and extended career support and adjustment to independent living. The program requires 39 credit hours of graduate course work, practicum, and field-based professional practice and research. Students can plan their programs to emphasize secondary and career programming, learning disabilities, collaborative vocational evaluation, traumatic brain injury, corrections, and business–education partnerships.

Admission Requirements for the Master of Education and Master of Arts in Education and Human Development

The Graduate School of Education and Human Development seeks applicants with strong academic potential, high motivation, and aptitude to do graduate-level work. Admission decisions are based on an evaluation of all material submitted in support of the application. The School requires official transcripts of all previous undergraduate and graduate course work and acceptable test scores on either the Graduate Record Examination or the Miller Analogies Test.

Two letters of recommendation and a statement of purpose are required. Most programs also require an interview with program faculty. The interview may be waived with permission of the lead faculty of the desired program for those living outside the Washington metropolitan area. All teacher education programs leading to initial licensure require a passing score on all elements of PRAXIS I for admission.

In addition to these basic requirements, individual programs may require relevant professional experience and other supporting documentation before a final decision on admission is made. Upon receipt of the application to the individual program, information on specific requirements will be sent to the applicant. The personal interview, professional experience, and supporting references provide important qualitative evidence concerning an applicant's academic potential and professional background.

The admission review is based upon a comparison of qualifications among all applicants, weighing both the School's general admissions criteria and program-specific criteria.

Positive decisions are made quickly for applicants who present uniformly strong application credentials in all areas. In some cases, unusually strong factors will offset comparatively weak factors and result in an offer of admission to provisional status in the School. For a student to be admitted to full candidacy from provisional status, he or she must earn grades of *B*− or better with a

minimum cumulative grade-point average of 3.0 in the first 9 credit hours of course work. Grades of *I* are not acceptable.

Advanced Standing

Advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 24 credit hours must be completed in the Graduate School of Education and Human Development as a master's candidate. A maximum of 12 credit hours taken in nondegree status may be credited toward the master's degree.

Advanced standing is not granted for work completed five or more years before application for admission or readmission to master's candidacy. All work accepted for advanced standing must have been earned with a grade of *B* or better and must be approved for acceptance by both the advisor and the dean. *Credit, Satisfactory, Audit,* or other nonletter grades are not acceptable.

Plan of Study

The plan of study leading to the degree of Master of Arts in Education and Human Development requires a minimum of 33 hours of graduate credit. Several programs have additional credit hour requirements. The plan may, at the student's option, include a thesis carrying six hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours must be from courses planned primarily for graduate students (third-group courses). A minimum of 12 hours, not including the thesis, must be from courses offered by the Graduate School of Education and Human Development.

Programs are initially reviewed in conference with an admissions advisor in the School and subsequently finalized with a designated advisor in the candidate's area of specialization. Programs are based on a candidate's interests and background; those related to teaching in public schools are designed around certification requirements of the state and locality in which the candidate plans to teach.

All degree requirements must be completed within six years, whether study is full time or part time. An additional (or seventh) year is allowed in the case of a student who breaks enrollment and is subsequently readmitted.

Thesis Option

Students may elect a thesis option. The choice of the thesis subject must be approved in writing by the student's advisor and filed in the office of the dean. A statement of the School's standards for the thesis and printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the office of the dean.

Payment of tuition for the thesis course entitles the candidate, during the period of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, additional time may be granted. The student must, however, be enrolled continuously in the program. If the preparation of the thesis extends beyond the additional time granted, the student must register for the entire 6 hours of thesis again and pay tuition as for a repeated course.

Master's Comprehensive Examination

Candidates in master's programs requiring 33 credit hours must take a comprehensive examination. Candidates in some nonteaching programs whose basic requirements exceed 36 credit hours may waive the comprehensive examination with approval of the academic advisor. Candidates who plan to take the examination must file a written application in the Dean's Office of the

Graduate School of Education and Human Development by the announced deadline. Comprehensive examinations are required of students in Educational Leadership and Administration, International Education, Education Technology Leadership, and all programs in the Department of Teacher Preparation and Special Education. See Continuous Enrollment and Maintaining Residence, above.

Second Master's Degree

Persons seeking a second master's degree in the Graduate School of Education and Human Development must complete all core and specialization requirements and a minimum residency requirement of 24 credit hours.

The Degree of Education Specialist

The program of advanced study leading to the degree of Education Specialist is for students with master's degrees in education who seek further professional preparation for specific objectives. The program is available in the fields of educational leadership and administration, counseling, curriculum and instruction, higher education administration, human resource development, and special education.

Admissions Requirements

The following are required for entrance to an Education Specialist program: a Master of Arts in Education and Human Development or its equivalent, two years of pertinent experience in an education or human development field, and a graduate scholastic average of at least 3.3 and an acceptable score on either the Graduate Record Examination or Miller Analogies Test. Two letters of recommendation, one from a professional supervisor and one from the most recent graduate faculty advisor, are required, along with a statement of professional goals. Each applicant must be interviewed and recommended by a faculty advisor in the major field.

Programs of Study and Degree Requirements

Individual programs are developed, through a plan of study worked out with a faculty advisor, to fit the candidate's skills, interests, and career goals. A minimum of 30 credit hours beyond the requirements of the degree of Master of Arts in Education and Human Development is required. At least 21 hours of this work must be taken in residence at GW. A maximum of five calendar years is allowed for completion of the program.

At least 12 of the required 30 hours must be in appropriate graduate courses in education selected from the following areas: (1) foundations and cognate study, (2) background and general principles of the field of study, and (3) an area of specialization. A graduate-level research methods course must be included in the program if it was not completed in previous graduate work.

The Comprehensive Examination

Successful completion of a six-hour written examination and/or an oral examination, at the option of the major field advisor, is required. Candidates taking the examination must be registered for at least 1 credit hour in the semester it is to be taken and must file a written application in the dean's office by the published deadline.

The Degree of Doctor of Education

The Graduate School of Education and Human Development offers programs of advanced study leading to the degree of Doctor of Education. These programs

provide major fields of study in curriculum and instruction, special education, educational administration and policy studies, human resource development, and higher education administration. Supporting fields are available in educational administration, higher education administration, counseling, curriculum and instruction, elementary education, human development, human resource development, international education, program evaluation, secondary education, special education, supervision, and teacher education. With the approval of a student's program planning committee, course work may be taken in other departments of the University and through the Consortium. All programs require study of interrelated areas of education and a doctoral dissertation in the major field of study.

All doctoral programs are designed to accommodate the needs of working professionals who must pursue their studies on a part-time basis. Required graduate courses, with few exceptions, are offered in the late afternoon and evening. In some programs, selected courses may be taken at off-campus locations.

Admission Requirements

The applicant must have adequate preparation for advanced study, including graduate work in fields prerequisite to his or her objective and comparable to that required for the degree of Master of Arts in Education and Human Development at this University. Students with a master's degree in a field other than education may be considered for doctoral study provided that the degree and previous experience are judged relevant by the major field program faculty.

For an application to be considered by the major field program faculty, an applicant must have a minimum graduate scholastic average of 3.3 on a scale of 4.0 and an acceptable score on the Miller Analogies Test or Graduate Record Examination. Programs often set higher admission standards, and the number of new doctoral students in each program is limited.

The applicant is strongly encouraged to schedule an interview with the director of graduate admissions, who will discuss the applicant's needs in relation to the School's resources, explain the required procedures and standards, and guide the applicant through the admission process. In addition, all applicants must have an interview with faculty members in the major field. Students receiving favorable recommendations from the major field faculty are admitted to precandidacy for the degree.

Precandidacy and Candidacy

The Doctor of Education program is divided into two stages: precandidacy and candidacy. In general, the degree program requires three or more years of full-time study beyond the master's degree or the equivalent in part-time study. Course work and the comprehensive examination must be completed within five years, and the entire program must be completed within eight years. The minimum residency requirement in degree status for the Ed.D. is 36 credit hours of course work in the precandidacy stage and 12 to 24 credit hours of dissertation research in the candidacy stage. In most cases, course work beyond the minimum is required.

In the precandidacy stage, all course work in the program must be completed and the comprehensive examination passed. Course work toward the doctorate is established on the basis of a framework of seven domains: knowledge of foundations; critical literature review; research methods; clarity of thought, as expressed both in speech and in writing; professional development; technological skills; and depth of knowledge of the specialty area. A program plan of study is developed between the doctoral student and a doctoral study advising team,

generally consisting of three members of the School faculty, one of whom is outside the student's program area.

The comprehensive examination is generally a two-day examination held each semester and taken upon completion of all course work (Pre-Dissertation Seminar may be excepted). Students taking the examination must be registered for at least 1 credit hour in the semester it is to be taken and must file a written application in the dean's office by the announced deadline. Programs may have specific comprehensive exam requirements.

The candidacy stage of doctoral study begins after successful completion of the comprehensive examination. A doctoral research dissertation committee is established and the candidate develops a dissertation proposal (this may be while registered in Pre-Dissertation Seminar). Upon successful completion of the comprehensive examination and the Dissertation Seminar, students must register for a minimum of 3 hours of Dissertation Research each fall and spring semester, until the satisfactory completion of the dissertation or the completion of 24 credit hours of dissertation research. Once they have reached their 24 credit hour maximum, they must register each subsequent fall and spring semester for 1 credit hour of Continuing Research until completion of their degree program with the successful defense of the dissertation to the Dissertation Oral Examination Committee and submission of two final edited copies of the dissertation and its abstract to the office of the dean.

Detailed information on the Ed.D. program and its administration is available in the GSEHD Doctoral Student Handbook. Students completing their degree program should refer to the section on Graduation Requirements, Participation in the Commencement Ceremony, under University Regulations, as well as the fee for microfilm service and binding the dissertation under Fees and Financial Regulations in this Bulletin.

The Degree of Doctor of Philosophy in the Field of Counseling

A Ph.D. in the field of counseling is offered through Columbian College of Arts and Sciences in collaboration with the Graduate School of Education and Human Development.

Graduate Certificate Programs

The Graduate School of Education and Human Development offers the following graduate certificate programs.

Advanced Web Design and Application in Education
Bilingual Special Education
Counseling Culturally and Linguistically Diverse Persons
Job Development and Placement
Leadership Development
Special Education and Brain Injury

SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Dean T.W. Tong
Associate Dean R.J. Harrington

The School of Engineering and Applied Science was organized in 1884 as the Corcoran Scientific School of Columbian University. It was named in honor of William W. Corcoran, president of the University's Board of Trustees from 1869 to 1888. The school was among the first to accept women for degree candidacy in engineering. The organization and offerings of the school have evolved over the years, but throughout most of its history the program has been characterized by its emphasis on the principles guiding the advancement of technology. The current name was adopted in 1962.

Through its five departments—Civil and Environmental Engineering; Computer Science; Electrical and Computer Engineering; Engineering Management and Systems Engineering; and Mechanical and Aerospace Engineering—the School of Engineering and Applied Science offers graduate study leading to the degrees of Master of Science, Master of Engineering Management, and Doctor of Science and to the professional degrees of Engineer and Applied Scientist. Programs are individually planned according to the student's preparation and needs. The School also offers many graduate-level certificate programs through its departments.

Among the special opportunities offered by the School are research institutes established to create opportunities for student and faculty research, strengthening ties with counterparts in government and industry, and contributing to the development and harnessing of emerging technology. These include the Center for Networks Research; Institutes for Computer Graphics, MEMS and VLSI Technologies, Magnetics Research, Materials Science, High-Speed Telecommunications, Knowledge and Innovation Management, and Crisis, Disaster, and Risk Management; Joint Institute for Advancement of Flight Sciences (located at the NASA–Langley Research Center in Hampton, Virginia); and National Crash Analysis Center.

Degree Programs

The following list shows the eight fields of graduate study and representative areas of focus. Degree requirements are presented in subsequent pages. Within some fields, students may choose to focus their course work in other specialties as well. For information on professional and doctoral degrees in a given field, contact the department administering the field.

Civil and Environmental Engineering

Engineering Mechanics
Environmental Engineering
Geotechnical Engineering
Structural Engineering
Transportation Safety Engineering
Water Resources Engineering

Computer Engineering

Computer Architecture and Networking
Microelectronics and VLSI Systems
Multimedia Processing

Computer Science

Algorithms and Theory
Bioinformatics
Computer Architecture and Networks

Computer Security and Information Assurance
Database and Information Systems
Machine Intelligence and Cognitive Science
Multimedia, Animation, Graphics, and User Interface
Parallel and Distributed Processing
Software Engineering and Operating Systems

Electrical Engineering

Biomedical Engineering
Communications and Networks
Electromagnetics
Signal Processing, Systems, and Controls

Engineering Management

Crisis, Emergency, and Risk Management
Economics, Finance, and Cost Engineering
Engineering and Technology Management
Environmental and Energy Management
Information Security Management
Knowledge Management
Management and Reliability of Infrastructure Systems
Software Engineering and Information Systems Management

Mechanical and Aerospace Engineering

Aerospace Engineering
Design of Mechanical Engineering Systems
Fluid Mechanics, Thermal Sciences, and Energy
Industrial Engineering
Solid Mechanics and Materials Science
Structures and Dynamics

Systems Engineering

Operations Research and Management Science
Systems Engineering and Integration

Telecommunications and Computers (M.S. only)

Telecommunications Networks
Telecommunications Network Security

Admission Requirements

Entrance requirements are outlined under individual degree programs, below.

Transfer of Credit

With the approval of the student's advisor and department chair, graduate credit may be transferred, when applicable, to meet degree requirements of the School. For a master's or professional degree candidate, or a doctoral candidate whose highest earned degree is a master's, up to 6 credit hours may be transferred. For a doctoral candidate whose highest earned degree is a bachelor's degree, up to 24 credit hours may be transferred from another doctoral program. No more than 6 transferred credit hours can be applied to a master's or professional program. The credit must have been completed with grades of *A* or *B* at another accredited and recognized institution, at a level of study equivalent to that being pursued at GW. In addition, the professional and doctoral degree programs require that the credit be earned no more than five years prior to admission to the GW program, and some departments require that it be earned more recently. Credit applied toward a previous degree may not be transferred. Trans-

fer of credit regulations apply to courses taken as a nondegree student through GW's Office of University Students; that is, up to 6 credit hours may be taken in nondegree status before applying for admission to degree status. For purposes of transfer of credit, the SEAS graduate certificate program is not considered a prior degree; at the discretion of the department concerned, the credit hours earned in a SEAS certificate program may be applied to a subsequent master's degree program.

English Language Requirements for Admission of International Students

Applicants from countries where English is not an official language must take the Test of English as a Foreign Language (TOEFL) or the academic International English Language Testing System (IELTS). The University looks for a minimum score of 550 (paper-based) or 213 (computer-based) on the TOEFL, or an overall band score of 6.0 on the academic IELTS with no individual band score below 5.0, in considering candidates for admission. Those admitted as degree candidates must take the GW English as a Foreign Language Placement Test. Only those students who score 600 (paper-based) or 250 (computer-based) or higher on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0, will be exempted from this requirement.

Depending on the test results, the student may be restricted in the number and type of courses that can be taken. Students assigned English as a Foreign Language (EFL) courses should anticipate additional related tuition expenses as well as possible extended periods of time required to complete their degree programs. Departments may set higher standards and should be consulted.

SEAS Regulations

Grades

Information on grades and computing the grade-point average is found under University Regulations.

At the option of the instructor, the grade of *I* (Incomplete) may be recorded if a student, for reasons beyond his or her control, is unable to complete the work of the course and if the instructor is informed of and approves such reasons before the date when grades must be reported. The grade may be used only if the student's prior performance and class attendance in the course have been satisfactory. Any failure to complete the work of a course that is not satisfactorily explained to the instructor before the date when grades must be turned in will be graded *F*. If acceptable reasons are later presented, the instructor may initiate an appropriate grade change. Although the grade of *I* may remain on the records for a maximum of one year, the instructor should normally set a much briefer period within which the uncompleted work must be made up. The grade of *I* cannot be removed by the student's reregistering for the course here or taking its equivalent elsewhere. An incomplete that is not removed within one calendar year or at the time of graduation of the student, whichever occurs first, is automatically changed to an *IF*. When the *I* is changed to a letter grade, the grade of *I* followed by the letter grade (e.g., *IB*) will appear on the student's record.

Credit/No Credit Grading System—SEAS students may take SEAS courses under the credit/no credit grading system, but credit for such courses cannot be applied toward any degree program in SEAS.

Program of Study

In consultation with the academic advisor, each student develops a program of study and enters it on a form that governs the student's degree requirements and that must be approved by the advisor and department chair. The form should be established soon after matriculation and must be completed before the student is certified for graduation.

Residence and Continuous Enrollment

All work for the degree must be done in residence unless an exception is granted by the department chair. A student in a degree program is expected to be continuously enrolled in the School until the degree is conferred. A student who breaks his or her registration must apply for readmission to the degree program under whatever conditions and regulations are in force at that time. To maintain continuous enrollment, a student may register in one of the following categories.

Leave of Absence—This status is available to students who are attending classes at another institution (special approval is required); who are temporarily transferred out of the area (e.g., for military TDY); or who are having temporary medical problems.

Continuing Research—Students who have completed their research credits, but are not yet ready to defend a thesis or dissertation, must register for 1 credit of Continuing Research each semester as appropriate.

Examination Preparation—Students who are studying for a comprehensive or qualifying exam for the current or following semester, and are not taking any courses, must register for 1 credit of Examination Preparation as appropriate.

Master's Degree Programs

Entrance Requirements

Admission to a master's degree program requires an appropriate bachelor's degree from a recognized institution and evidence of capacity for productive work in the field selected, such as may be indicated by undergraduate grades, GRE scores, and similar data. Although GRE scores are not generally required for admission to SEAS, applicants are encouraged to take the examination. In general, a grade average of *B* (3.0 on a scale of 4.0) in the last 60 hours of undergraduate course work is required. Department-specific requirements are indicated below.

Scholarship Requirements

A minimum grade-point average of 3.0 is required for award of a master's degree. All graduate courses and undergraduate courses taken for graduate credit after becoming a degree candidate will count in the grade-point average. A student who receives two grades of *F* or three grades below *B*− is barred from further enrollment in graduate courses and, ordinarily, will not be readmitted as a degree candidate. A student may not repeat for credit a course in which he or she has received a grade of *C*− or above, unless required to do so by the department chair. A written statement requiring the student to repeat such a course for credit must be submitted to the registrar by the department chair.

Time Limits

A full-time student in the master's program is allowed a maximum of three calendar years (excluding the time spent taking only English as a Foreign Language courses) to complete all degree requirements, from the date of first registration as a degree candidate in prerequisite or graduate courses. A part-time student in the master's program is allowed a maximum of five calendar years. The time limit does not include any period of registration as an unclassified student before admission to degree candidate status or any period spent on approved leave of absence. Students who do not complete degree requirements within the allowed time will have their degree candidate status terminated. They may be readmitted to degree candidate status under conditions specified by the department chair and approved by the dean.

Master's Thesis

The master's thesis must demonstrate the student's ability to make independent use of the knowledge and discipline of thought acquired through graduate study, to undertake constructive work in a given field, and to communicate the results of the work in writing. Suitable work for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

To register for the thesis course (299), the candidate must submit the thesis area to the appropriate department chair, on the form obtained from the department office and approved by the faculty advisor. At the beginning of the semester of expected graduation, the candidate must submit the thesis title to the dean, on the form available in the department office. While registered in the thesis course sequence 299–300, the student is entitled to the advice of the faculty member under whom the thesis is to be written. Students may consult with their advisors, but they have primary responsibility for the thesis. Students orally defend their thesis before a committee of School faculty.

The thesis in final form must be submitted to the department chair by the stated deadline. In the event a thesis is unfinished on the date specified, the student must register for continuing research. The overall time limit for earning the degree (see Time Limits, above) may not be exceeded.

Copies of detailed regulations regarding the form and reproduction of the thesis are available in the department office. Accepted theses, with accompanying drawings, become the property of the University and are deposited in the Gelman Library, where the duplicate copies are bound and made available for circulation.

Fields of Study

Graduate programs in the School of Engineering and Applied Science are available in eight fields of study, indicated under the offering department, below. Each field in turn encompasses several areas of focus. The course of study responds to the unique interests of the student, who designs an individual program in close consultation with the assigned advisor. In most areas, students follow a prescribed core and elect approved courses from within the School of Engineering and Applied Science and from other schools of the University. Because engineering expertise includes a broad foundation in technology, engineering study may profitably be combined with study in other areas to sharpen the engineer's focus in practice.

Students must have satisfied, through undergraduate studies, the prerequisites specified, or approved equivalents.

Department of Civil and Environmental Engineering

The Department of Civil and Environmental Engineering administers the field of civil and environmental engineering. In addition to the entrance requirements stated above, the applicant is expected to have an undergraduate degree in engineering, the physical sciences, or applied mathematics. Minimum requirements for the degree are 33 hours of course work or 24 hours of course work and 6 hours of thesis.

Representative Areas of Focus Leading to the Master of Science

Engineering Mechanics—Required: ApSc 213; CE 220, 227.
Environmental Engineering—Required: CE 242, 250, 258.
Geotechnical Engineering—Required: CE 227, 231, 254.

Structural Engineering—Required: CE 205, 210, 227.
Transportation Safety Engineering—Required: CE 227, 260.
Water Resources Engineering—Required: CE 242, 250, 258.

Department of Computer Science

The Department of Computer Science administers the field of computer science. In addition to the entrance requirements stated above, students are expected to be adequately prepared in the basic physical sciences and in mathematics (one year each of university laboratory science and of math beyond precalculus), and have taken a course in computer programming using a structured language and CSci 123, 133, and 135 or their equivalents.

The program of study must have a minimum of 30 credit hours, of which at least 24 credits must be at the 200 level or above. CSci 210, 211, 212 are required. The following undergraduate courses may be taken for graduate credit if they are included in the student's approved program of study: CSci 173, 174, 175, 185, 187, 188, 189, 190, 191, 193, and 194. Normally, no more than two courses may be taken outside of those offered by the department.

Graduate students are required to attend several department colloquia each semester. These are intended to broaden the student's professional outlook and to encourage interaction with the faculty. Schedules are posted.

Representative Areas of Focus Leading to the Master of Science

Algorithms and Theory
Bioinformatics
Computer Architecture and Networks
Computer Security and Information Assurance
Database and Information Systems
Machine Intelligence and Cognitive Science
Multimedia, Animation, Graphics, and User Interface
Parallel and Distributed Processing
Software Engineering and Operating Systems

Department of Electrical and Computer Engineering

The Department of Electrical and Computer Engineering administers the fields of computer engineering, electrical engineering, and telecommunications and computers. In addition to the entrance requirements for the degree listed above, students are required to have a bachelor's degree in electrical engineering, computer engineering, or computer science and be adequately prepared in the basic physical sciences and in mathematics. Students with a bachelor's degree in another field and a basic knowledge of (a) mathematics and (b) electrical engineering, computer engineering, or computer science may be admitted, with a set of deficiency courses to be determined by the student's advisor.

The student is required to take three of the following seven courses: ECE 201, 203, 210, 211, 219, 225, and 248. The student chooses additional courses (five courses in the thesis option, or seven courses in the non-thesis option) based on individual interests, subject to the approval of the student's faculty advisor. A maximum of three courses at the 100 level may be counted toward the requirements for the degree.

Computer Engineering—Representative areas of focus leading to the Master of Science degree include computer architecture and networking, microelectronics and VLSI systems, and multimedia processing.

Electrical Engineering—Representative areas of focus leading to the Master of Science degree include biomedical engineering; communications and networks; electromagnetics; and signal processing, systems, and controls.

Telecommunications and Computers—Representative areas of focus leading to the Master of Science degree include telecommunications and networks and telecommunications network security.

Department of Engineering Management and Systems Engineering

The Department of Engineering Management and Systems Engineering administers the field of engineering management and the field of systems engineering. Both the Master of Science and Master of Engineering Management degrees are offered by the Department; in general, the Master of Science is the more technical of the two degrees. Both thesis and non-thesis options are available.

A grade of *C* or better in Math 32 or its equivalent is prerequisite to all graduate programs offered by the Department. The Department requires that the applicant have a suitable bachelor's degree in an area such as engineering, a physical science, or mathematics from a recognized university with a *B* or better average for the last two years of undergraduate study. Applicants with different academic backgrounds may be considered for admission; additional course work or other requirements may be a condition of admission in such cases.

A minimum of 36 credit hours is required, including EMSE 212, 260, 269, and 283 as the core courses in the Department. Each area of focus has specified course requirements, with electives as part of the program.

Engineering Management

Areas of Focus Leading to the Master of Engineering Management

Economics, Finance, and Cost Engineering
Engineering and Technology Management
Knowledge Management
Management and Reliability of Infrastructure Systems

Areas of Focus Leading to the Master of Science

Crisis, Emergency, and Risk Management
Engineering and Technology Management
Environmental and Energy Management
Information Security Management
Software Engineering and Information Systems Management

Systems Engineering

Areas of Focus Leading to the Master of Science

Operations Research and Management Science
Systems Engineering and Integration

Department of Mechanical and Aerospace Engineering

The Department of Mechanical and Aerospace Engineering administers the field of mechanical and aerospace engineering. In addition to the entrance requirements stated above, the applicant is expected to have a background that includes an undergraduate degree in engineering, the physical sciences, or applied mathematics. The minimum program consists of 33 credit hours of course work or 24 credit hours of course work plus a master's thesis (6 credits). Some areas of mechanical and aerospace engineering leading to the Master of Science are offered at the NASA–Langley Research Center in Hampton, Virginia. NASA–Langley's extensive scientific and engineering facilities are used whenever possible.

Representative Areas of Focus Leading to the Master of Science

Aerospace Engineering—Required: ApSc 212 or 213 and MAE 286; one course chosen from MAE 207, 221, or 276. Students may focus their course work on aeroacoustics, aeronautics, astronautics, propulsion, or space systems.

Design of Mechanical Engineering Systems—Required: MAE 243, 251, 286. Students may focus their course work on computer-aided design, computer-

integrated design and manufacturing, mechanical engineering design, and robotics.

Fluid Mechanics, Thermal Sciences, and Energy—Required: ApSc 213; MAE 221, 286.

Industrial Engineering—Prerequisite: Math 33, ApSc 115; CSci 49, 50, or 100. Required: EMSE 260, 282; MAE 201, 252; two approved three-course sequences, one in the Department of Mechanical and Aerospace Engineering, the other in a cooperating department in SEAS.

Solid Mechanics and Materials Science—Required: ApSc 213; MAE 210, 231, or 235.

Structures and Dynamics—Required: ApSc 213; MAE 207, 286.

Professional Degree Program

The School of Engineering and Applied Science has established the professional degree program for those students who wish to pursue course work beyond the master's degree with emphasis on applied subject material rather than on basic research. Successful completion of the professional degree program leads to the degree of Engineer or of Applied Scientist.

Entrance Requirements

Admission to study toward the professional degree requires an appropriate master's degree from a recognized institution and evidence of capacity for productive work in the field selected as indicated by prior scholarship and, where appropriate, professional experience. The Departments of Computer Science and of Electrical and Computer Engineering require applicants for the professional degree to have had two years of professional experience after receiving the master's degree.

To study toward the degree of Engineer, an applicant must have earned a bachelor's degree and a master's degree in an area of engineering.

To study toward the degree of Applied Scientist, an applicant must possess a master's degree in engineering, computer science, natural science, or mathematics. Applicants who have an equivalent quantitative background may be considered as special cases by the respective departments.

Normally, a *B* average in graduate work is required, although the departments often set higher admission standards. Some programs have specified prerequisites. An applicant who has significant deficiencies in preparation may be required to take prescribed prerequisite courses, which do not count toward any part of the requirements for the professional degree.

Program Requirements

The minimum program consists of 30 credit hours of approved graduate courses beyond a master's degree. Students whose graduate study does not include necessary prerequisites may be required to take additional course work.

Programs are determined by established prerequisites and the requirements of the department in which the student wishes to study. The program of each professional degree candidate must be approved by the student's advisor and the department chair.

Each department may require its degree candidates to undertake and defend the results of a technical design project or a development problem or to prepare a comprehensive technical report to demonstrate the candidate's ability to make independent use of the knowledge and discipline of thought acquired through graduate study. When applicable, the student will be informed of this requirement by the faculty advisor at the time the student's program is being formulated. The project may not be more than 6 credit hours out of the minimum 30.

For requirements of a specific professional degree program, please consult the department concerned.

Scholarship Requirements

If a student studying for the professional degree receives two grades of *F* or three grades below *B*−, study is terminated and further enrollment prohibited. A student must have a final grade-point average of 3.0 to receive the degree. The Department of Engineering Management and Systems Engineering requires a final grade-point average of at least 3.4.

Time Limits

A full-time student in the professional degree program is allowed a maximum of three calendar years to complete all degree requirements, from the date of first registration as a degree candidate in prerequisite or graduate courses. A part-time student in this program is allowed a maximum of five calendar years. The time limit does not include any period of registration as an unclassified student before admission to degree candidate status or any period spent on approved leave of absence.

Students who do not complete degree requirements within the allowed time will have their degree candidate status terminated. They may be readmitted to degree candidate status under conditions specified by the department chair.

Relationship with the Doctoral Program

Candidates for the Doctor of Science degree or professional degree who are in good academic standing may, with the approval of the faculty advisor and department chair, transfer from one degree program to the other within their department if they meet the qualifications and requirements specified by the department. In the Department of Engineering Management and Systems Engineering, only one such transfer is permitted.

Doctor of Science Degree Program

The doctoral program is designed to prepare the student for a career of creative scholarship by providing a broad but balanced background of knowledge and guidance in the performance of research. The program is divided into two stages. The first comprises a study of related fields of learning that support the general area of research concentration and culminates in the qualifying examination. The second, composed of original research and the presentation of findings in a written dissertation, culminates in the final examination.

Entrance Requirements

Admission to the Doctor of Science degree program requires an appropriate earned baccalaureate or master's degree from a recognized institution, completed course work designated by the department as pertinent to the field to be studied, an acceptable professional background, and a capacity for creative scholarship. All applicants must submit scores from the Graduate Record Examination general test and provide two letters of recommendation. Students whose highest earned degree is a baccalaureate must present a grade-point average of at least 3.3 on a scale of 4.0 in undergraduate work. For students whose highest earned degree is a master's degree, departmental requirements for the grade-point average in course work leading to that degree are as follows (on a scale of 4.0): Civil and Environmental Engineering, Electrical and Computer Engineering, and Mechanical and Aerospace Engineering, 3.4; Computer Science, and Engineering Management and Systems Engineering, 3.5. Consult the department concerned for field-specific admission requirements.

Program Requirements

Upon admission to the first stage of the program (that is, study of related fields culminating in the qualifying examination), the student is assigned a faculty advisor who directs his or her studies. In some departments a faculty committee may be appointed instead of a single advisor. Programs of study are structured to include a major field and two minor or supporting fields. Check with the department concerned for requirements.

A minimum of 30 credit hours in a formal program at the graduate level beyond master's study or, for students without master's degrees, a minimum of 54 credit hours in a formal program at the graduate level beyond the baccalaureate, is required. In many cases, particularly when the student undertakes a doctoral program in a field other than that in which the earlier degree was obtained, the program of study exceeds the minimum number of credit hours. Consult the department concerned for specific curriculum requirements. In addition, all doctoral students take a minimum of 24 hours of dissertation research.

Departments may establish a tool requirement, such as an examination in a computer language.

The Department of Computer Science requires a preliminary examination that must be passed within four semesters of starting the program. It comprises core material from CSci 210, 211, and 212 but is not limited to these courses.

The Department of Electrical and Computer Engineering requires a preliminary examination that must be taken within five semesters of entering the program. The examination is guided by but not limited to the core material of the master's program. Specific details regarding the structure of the exam are available in the department.

Students admitted to doctoral study are encouraged to undertake one year of full-time study on campus. In general, the advisor will require the student to register for a minimum of 6 credit hours of course work in every fall and spring semester.

To be admitted to the qualifying examination, the student must have an overall grade-point average of 3.2. The Department of Mechanical and Aerospace Engineering and the Department of Engineering Management and Systems Engineering require a cumulative grade-point average of at least 3.4.

If a doctoral student receives two grades of *F* or three grades below *B*−, graduate study is terminated and further enrollment prohibited. Courses in which the student earns grades below *B*− are not included in the total credit-hour requirement for the degree. Students who receive any grade below *B*− are required to review their programs of study with their advisors.

The Qualifying Examination

The qualifying examination is the principal means of determining whether a student will qualify as a candidate for the doctoral degree and progress to the second stage of the program. Its purpose is to ascertain that the student's background and intellectual development are adequate to support doctoral research in the central field. (Some departments may administer a prequalifying examination prior to completion of the study program.)

Qualifying examinations may be written or oral, or both, and are scheduled over a period of several days. They are conducted on dates established by the departments and are administered by a faculty committee. Upon favorable report of the examiners to the dean through the department chair, the student is admitted to candidacy for the degree; the student then begins specialized study and research under the supervision of a designated member of the faculty or, in special instances, an outstanding engineer or scientist who is not a member of the faculty.

At the discretion of the committee that prepared the examination, a student who fails any part of the qualifying examination may be given a second opportunity to qualify for candidacy. Usually, the entire examination must be retaken.

Students who fail to qualify for candidacy in a doctoral program of the School will be considered to have failed on a school-wide basis and will not be admitted to further doctoral study within the School.

Dissertation and Final Examination

The student admitted to candidacy for the degree of Doctor of Science chooses the faculty member under whom he or she wishes to conduct research; the faculty member may accept or reject the request to serve as the student's director of research. The research area is approved by the director, and throughout the remainder of the doctoral program the candidate conducts dissertation research under the director. However, the student may consult other members of the faculty on an informal basis. Work on the dissertation encompasses a minimum of 24 credit hours.

The Dissertation—A dissertation is required as evidence of ability to perform original scholarly research and to present and interpret the results. The student is solely responsible for the content of the dissertation.

The dissertation should embody the results of an extended original study and include material deemed worthy of publication in recognized scientific and engineering journals. The student is expected to attempt to have the results of the research published as soon as possible after he or she receives the degree and to submit copies of the published material to the dean. The Departments of Computer Science and of Engineering Management and Systems Engineering require submission of a conference paper or an article to a refereed journal prior to completion of degree requirements. Credit must be given in the publication to the fact that the material is abstracted, summarized, or developed from a dissertation submitted to George Washington University in partial fulfillment of the requirements for the Doctor of Science degree.

The candidate must submit to the department five complete copies of the dissertation and an abstract (not to exceed 350 words). Copies of detailed regulations regarding the form and reproduction of the dissertation and preparation of the abstract are available in department offices. Accepted dissertations, with accompanying drawings, become the property of the University and are deposited in the Gelman Library, where bound copies are available for circulation.

The Final Examination—Upon acceptance of the dissertation by the research committee, the candidate is presented for the final examination. The final examination is oral and is open to the public. The candidate must demonstrate a mastery of the special field of study and of the materials and techniques used in the research. The committee of examiners may include qualified experts brought to the University especially to participate in the examination. The director of research usually serves as advocate for the candidate. Students should consult department regulations concerning the formation of the committee. When the examining committee is convinced of the quality and originality of the candidate's contribution to knowledge as well as his or her mastery of the scholarship and research techniques of the field, the committee recommends the candidate for the degree of Doctor of Science. The candidate should consult the department chair about scheduling the examination.

Students completing their degree program should refer to the section on Graduation Requirements, Participation in the Commencement Ceremony, under University Regulations, as well as the fee for microfilm service and binding the dissertation under Fees and Financial Regulations in this Bulletin.

Enrollment Requirements

Full-time doctoral students must register for a minimum of 9 hours per semester until 24 hours of Dissertation Research have been completed, and 1 hour of Continuing Research each semester thereafter until satisfactory completion of

the final examination. Part-time doctoral students must normally register for a minimum of 6 hours per semester until 24 hours of Dissertation Research have been completed and 1 hour of Continuing Research each semester thereafter until satisfactory completion of the final examination. No minimum load is required during the summer sessions.

Time Limits

In general, one year of study is the minimum amount of time to be spent in preparation for the qualifying examination, although the student may apply for the examination whenever he or she feels properly prepared. The qualifying examination must be completed within five years of the date of admission, and the entire degree program must usually be completed within seven years. A minimum of two years of full-time study and research should be expected in meeting the requirements for the degree. The time period for completion of the degree will be adjusted for an approved leave of absence. All time periods listed above are increased by two years for a student entering the doctoral program without a master's degree.

Graduate Certificate Programs

The School of Engineering and Applied Science offers graduate certificate programs in several fields. At the discretion of the respective departments, credit earned in the certificate program can be applied to a subsequent master's degree program. Details are available in the Office of the Dean. Certificate programs include the following:

Computer Architecture and Networking
Computer-Integrated Design in Mechanical and Aerospace Engineering
Computer Security and Information Assurance
Emergency Management and Public Health
Engineering and Technology Management
Homeland Security Emergency Preparedness and Response
Information and Security Management
Knowledge Management
Knowledge and Innovation Management
Optical Communications and Networks
Systems Engineering
Telecommunications Networks
Telecommunications Security and Electronic Warfare
Wireless and Mobile Networks

ELLIOTT SCHOOL OF INTERNATIONAL AFFAIRS

Dean H. Harding
Associate Deans H.L. Agnew, K. Lord, E.A. McCord

The Elliott School of International Affairs offers graduate and undergraduate programs to prepare individuals for understanding and working in an increasingly globalized world. The historical roots of the Elliott School extend back to the establishment of the School of Comparative Jurisprudence and Diplomacy in 1898. In 1966, the School separated from the School of Government, Business, and International Affairs to become an independent unit, the School of Public and International Affairs. In 1987, the name was changed to the School of International Affairs, and in 1988 the School was renamed in honor of Evelyn E. and Lloyd H. Elliott. Lloyd Elliott was the President of The George Washington University from 1965 to 1988.

Master's Degree Programs

The Elliott School offers degree programs leading to the Master of Arts in the fields of international affairs, Asian studies, European and Eurasian studies, international development studies, international science and technology policy, international trade and investment policy, Latin American and hemispheric studies, and security policy studies. The Elliott School also offers a Master of International Policy and Practice degree for mid-career professionals and a Master of International Studies degree for students enrolled in master's degree programs at universities with which the Elliott School has a special partnership.

These programs provide advanced academic and professional training in international affairs as preparation for employment in public, private, and nonprofit sectors. Focusing on major historical and contemporary issues in international affairs, the programs are both interdisciplinary and multidisciplinary, combining courses offered through the School with courses offered by other schools and departments of the University.

Admission Requirements

Admission is normally for the fall semester and may be for full- or part-time study. Admission to master's programs in the Elliott School is highly competitive. To be considered for admission, applicants must present a bachelor's degree from an accredited college or university. Records of academic performance, letters of recommendation, and a personal statement are the principal components of an application. Scores on the general test of the Graduate Record Examination are required for Master of Arts applicants and encouraged but not required for Master of International Policy and Practice applicants. In addition, the applicant's motivation, professional experience, and academic preparation in economics and foreign language study will be considered in the selection process. Eight years of professional experience are generally required of Master of International Policy and Practice applicants.

The following additional requirements pertain to all applicants whose native language is not English and who have not graduated from a college or university in which English is the language of instruction—Applicants are required to submit scores from the Test of English as a Foreign Language (TOEFL) or the academic International English Language Testing System (IELTS). The Test of Written English (TWE) is recommended for those who take the TOEFL. To be considered for admission, applicants are normally expected to have a minimum score of 600 (paper-based) or 250 (computer-based) on the TOEFL, or an overall band score of 7.0 on the academic IELTS with no individual band score below 6.0. Applicants admitted as degree candidates will be required to take the English as a Foreign Language Placement Test at George Washington University before registering. Applicants who receive a TOEFL score of 620 on the paper

test or 260 on the computer test and have a 5 or better on the TWE, or have an overall band score of 7.0 on the academic IELTS, with no individual band score below 6.5, are exempted from the EFL placement test. EFL course work may be required, depending on the applicant's performance on the placement test, but may not be applied toward the degree. Students who are required to take EFL courses must do so at their own expense and may find that their progress toward completing the degree may be delayed.

International Affairs—The applicant's undergraduate program should include courses in international affairs or other relevant social sciences, including introductory micro- and macroeconomics and at least two years of undergraduate study of a modern foreign language. In the case of major deficiencies in the social sciences (especially economics) or foreign language preparation, additional course work may be specified beyond the minimum requirements for the master's degree.

Asian Studies—An undergraduate major in a pertinent field and at least two years of study of an appropriate Asian language are required.

European and Eurasian Studies—An undergraduate major in a relevant field is preferred, including a good background in European history and political systems. The undergraduate program should include satisfactory completion of at least two years of an appropriate European or Eurasian language.

International Development Studies—The applicant's undergraduate program should include courses in international affairs or other relevant social sciences, including introductory microeconomics, a course in statistics, and at least two years of study of a modern foreign language. International experience in development or a related field is important and can compensate for gaps in academic preparation.

International Trade and Investment Policy—The applicant's undergraduate program should include at least one semester each of intermediate microeconomic theory, intermediate macroeconomic theory, statistics, and at least two years of study of a modern foreign language. Undergraduate courses in intermediate micro- and macroeconomics are highly desirable.

Latin American and Hemispheric Studies—The applicant's undergraduate program should include background course work related to Latin America and at least two years of study of Spanish or Portuguese. Majors in other fields may be considered for admission provided that undergraduate course work includes Spanish or Portuguese and sufficient course work in one of the following areas: anthropology, economics, geography, Hispanic literature, history, and political science.

International Science and Technology Policy—Undergraduate majors in a social, life, or physical science or in engineering are eligible for admission. Analytic skills and interest in policy issues with significant science or technology dimensions are more important determinants of success in the program than any particular formal training or academic background.

Security Policy Studies—An undergraduate background similar to that specified above for International Affairs would be appropriate. Work experience in the military or national security fields might compensate in part for some gaps in academic preparation. A background in economics or quantitative analysis skills is helpful.

Readmission

A graduate student who has not been continuously enrolled or on approved leave of absence must file an application for readmission the semester before planning to return to school.

Scholarship Requirements

Information on grades and computing the grade-point average is under University Regulations. Courses taken to satisfy degree requirements cannot be taken on a Credit (*CR*) basis, with the exception of Thesis Research and capstone courses for M.A. students and the M.I.P.P. Seminar for M.I.P.P. students.

Graduate students are required to maintain a minimum cumulative grade-point average of 3.0. Students whose cumulative grade-point average falls below 3.0 at any time after having completed at least 9 credit hours will be given an additional semester in which to raise the grade-point average above 3.0. Those who fail to bring their grade-point average over 3.0 at the end of the additional semester will not be allowed to continue in the program. For part-time students and those enrolled in summer sessions, a semester is interpreted to mean a time interval in which at least 9 credit hours have accrued.

A master's candidate who receives a grade of *F* is required to present cause as to why he or she should be allowed to continue in the program of studies.

The symbol *I* (Incomplete) indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. When work for the course is complete, the grade earned will be indicated by the letter *I* followed by the letter grade. An Incomplete cannot be made up after the lapse of one calendar year. An Incomplete that is not made up by the end of one calendar year becomes a grade of *IF* on the student's record. An Incomplete cannot be removed by reregistering for the course. If there are more than two Incompletes outstanding on the record, the student is not permitted to register for any courses, including the capstone course.

A student who fails to meet the established deadlines for completion of course work or other requirements of the program and is granted an extension may be required by the dean and the Dean's Council to register for 3 credit hours of graduate Reading and Research for each semester that the work is delinquent.

General Requirements for Master of Arts Degree Programs

Programs leading to the Master of Arts degree require a minimum of 40 credit hours of graduate course work and may include a thesis (the Security Policy Studies program does not have a thesis option). In all programs, students must pass a multidisciplinary capstone course at the conclusion of their program.

Candidates for the degree of Master of Arts are required to submit an advisor-approved plan of study (fields, supporting course work, etc.) to the office of student services by the end of the first semester in residence. Master's degrees are awarded by vote of the faculty after the student has completed the required course work and an acceptable thesis (if one is elected), has satisfied the foreign language requirement, and has successfully completed the capstone course.

Under special circumstances undergraduate courses numbered 101–200 may be counted toward the master's degree when registration for graduate credit has been approved at the beginning of the course by the curriculum advisor, the instructor, and the dean. The student who takes an undergraduate course for graduate credit is expected, by arrangement with the instructor, to do work at the graduate level in addition to the regular work of the course. Normally, no more than 9 hours of undergraduate course work may be taken for graduate credit in the 40-credit-hour program. Academic credit counted toward a previous degree may not be counted toward the master's degree.

All master's degree candidates must complete degree requirements within five years of their admission to the program. A student who is unable temporarily to continue the plan of studies may request a leave of absence not to exceed one year. Extensions beyond the five-year period may be granted in exceptional circumstances, but the student will be required to register and pay for 3 credit hours of Reading and Research each semester.

No more than 6 hours of graduate credit may be transferred from other accredited institutions or another division of the University, and these may be accepted only under limited conditions of time, grades, and relevance to the student's program.

Curriculum Requirements

Curriculum requirements for the Master of Arts programs are listed under the appropriate heading in Courses of Instruction—International Affairs, Asian Studies, European and Eurasian Studies, International Development Studies, International Science and Technology Policy, International Trade and Investment Policy, Latin American and Hemispheric Studies, and Security Policy Studies. Students should consult the program director concerning Special Topics courses that may be applicable to their program.

Foreign Language Requirements

In most degree programs, a candidate for the degree of Master of Arts must demonstrate reading and speaking proficiency (certified by the relevant language department) in a modern foreign language. Students in regional programs must demonstrate their ability in a language appropriate to the study of the specific region. If a student selects a language not offered by the University, a testing fee will be charged.

Each student whose native language is English must take a diagnostic exam in a foreign language during graduate student orientation. Students must also pass a reading and oral proficiency exam during the last 20 hours of residence in the program. No student may take the proficiency examination more than three times. Failure to pass the exam after three attempts results in immediate dismissal from the University. Students should consult their program guidelines for specific requirements, possible academic credit, and options concerning the language requirement.

Candidates in security policy studies may substitute advanced course work in statistics for a foreign language. Candidates in international science and technology policy have no foreign language requirement; however, proficiency in a foreign language may be used to meet the program's analytical competency requirement if it can be shown to be integral to the student's program of study.

For all Elliott School degree programs, students who are not native speakers of English are also required to pass an English examination; this requirement is in addition to the TOEFL required for admission. The examination, which tests high-level reading and writing proficiency, is administered by the English as a Foreign Language Department, and should be successfully completed before the end of the candidate's second semester. This requirement is in addition to the statistics requirement in the security policy studies program and the analytical competency requirement in the science, technology, and public policy program.

Capstone Course

Every student must successfully complete a capstone course near the conclusion of the master's program. Most programs offer the capstone course once a year, during the spring semester. The student must have a 3.0 grade-point average and must have completed or registered for 30 hours before participating in the course. If there is a lapse of time between completion of other course work and the capstone course, the student must be continuously enrolled during this period. A student who fails to successfully complete the capstone course may repeat it with the permission of the dean. If the student fails a second time, no further opportunity to complete the course will be permitted and the degree will not be conferred. Details concerning the capstone course vary across programs. Students should consult their program guidelines for details.

Thesis Option

Exceptional students may write a thesis if they qualify by having a minimum 3.5 grade-point average for at least 20 hours of course work in their program, submitting for approval a previously written research paper of high quality, and developing a formal thesis proposal approved by their prospective thesis advisor.

The thesis subject should be selected as early as possible so as to permit effective integration with the course work. A student will not be permitted to register for Thesis Research (IAff 299–300) until the thesis subject has been formally submitted to the dean's office. Most programs set additional requirements in order to qualify to write a thesis. The subject must be approved by the member of the faculty under whom the thesis is to be written, a second member of the faculty who will serve as a reader, and the student's program director. The thesis in its final form must have the approval of the thesis director and one other reader, and two copies must be presented to the dean by the student no later than the date announced in the University Calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the student services office. A fee for binding must be paid upon completion of the thesis.

Payment of tuition for thesis research entitles the candidate, during the period of registration, to the advice and direction of the thesis director and the other reader. In case a thesis is unfinished, the student must maintain continuous enrollment and is allowed one calendar year to complete it. If the preparation of the thesis extends beyond the additional calendar year, the student must register for the entire 6 hours of thesis again and pay tuition as for a repeated course.

General Requirements for the Master of International Policy and Practice Degree Program

The Master of International Policy and Practice requires a minimum of 27 credit hours of graduate course work. Students are required to take one course in either international or comparative politics, one course in international economics, and the M.I.P.P. Seminar. For the remainder of the program, students must submit an advisor-approved plan of study to the program director before the start of the first semester in residence and to the student services office by the end of the first semester in residence.

Under special circumstances undergraduate courses numbered 101–200 may be counted toward the master's degree when registration for graduate credit has been approved at the beginning of the course by the program director, the instructor, and the dean. The student who takes an undergraduate course for graduate credit is expected, by arrangement with the instructor, to do work at the graduate level in addition to the regular work of the course. No more than 6 hours of undergraduate course work may be taken for graduate credit in the 27-hour program.

M.I.P.P. candidates must complete degree requirements within three years of their admission to the program. A student who is temporarily unable to continue the plan of studies may request a leave of absence not to exceed one year. Extensions beyond the three-year period may be granted in exceptional circumstances, but the student will be required to register and pay for 3 credit hours of Reading and Research each semester.

No transfer credit from any institution other than The George Washington University is accepted into the M.I.P.P. program. No more than 6 hours of graduate credit taken in any degree or nondegree status within The George Washington University, including the Elliott School, may be transferred to the M.I.P.P. program.

Special Programs

Joint Master of Arts and Juris Doctor Degree Program

The Elliott School of International Affairs cooperates with the Law School in offering a program of study leading to the degrees of Master of Arts and Juris Doctor. A student must be accepted for admission by both the Elliott School and the Law School. Applications should be made separately to each school, with a notice of interest in the combined program. Students may also apply for the joint degree program after they have begun either program. The Law School stipulates that the first year of course work for the Juris Doctor degree must be taken as a unit; students should consult with the Associate Dean of the Law School for Student Affairs.

The Master of Arts degree program consists of a 40-credit-hour program that may not include a thesis. The student selects a degree program offered by the School and fulfills all of the requirements for the Master of Arts degree as well as fulfilling the requirements for the Juris Doctor degree. As part of this program, each School accepts up to 12 credit hours of course work from the other school in fulfillment of its degree requirements. The program takes approximately four years of full-time study for completion.

Joint degree students must meet all requirements for both programs prior to receiving either diploma. All work for this combined degree program must be completed in five years, unless an extension of time is granted by the respective deans.

Joint Master of Arts and Master of Business Administration Degree Program

The Elliott School of International Affairs cooperates with the School of Business in offering a program of study leading to the degrees of Master of Arts in one of six fields and Master of Business Administration with a field of study in international business. The joint degree program is offered in the Elliott School fields of international affairs, international trade and investment policy, Asian studies, European and Eurasian studies, and Latin American and hemispheric studies. The student must be accepted for admission by both the Elliott School and the School of Business. Applications should be made separately to each school, with a notice of interest in the combined program. Students may also apply for the joint degree program after they have begun either program.

The joint degree program consists of 66–70 credit hours of course work. As part of this program, each school accepts up to 12 credit hours of course work from the other school in fulfillment of its degree requirements. The program takes approximately three years of full-time study for completion. Joint degree students must meet all requirements for each program prior to receiving either diploma. All work for this combined degree program must be completed in six years, unless an extension of time is granted by the respective deans.

Dual Master of Arts and Master of Public Health Degree Program

The Elliott School of International Affairs cooperates with the School of Public Health and Health Services in offering a dual degree program leading toward the Master of Arts in one of five fields and the Master of Public Health in international health. The dual degree program is offered in the Elliott School fields of international affairs, international development studies, Asian studies, and Latin American and hemispheric studies. The student must be accepted for admission by both the Elliott School and the School of Public Health and Health Services. Applications should be made separately to each school, with a notice of interest in the combined program. Students may also apply for the dual degree program after they have begun either program.

The dual degree program consists of approximately 68 credit hours of course work. As part of this program, the Elliott School accepts up to 12 credit hours of course work from the School of Public Health and Health Services in fulfillment of its degree requirements. The program takes approximately three years of full-time study for completion.

Dual degree students may complete the requirements for each degree and receive a diploma for each degree independently. However, all work on each degree must be completed within five years from the student's entry into that program, unless an extension of time is granted by the respective deans.

Graduate Certificates

The Elliott School of International Affairs offers programs of study leading to a graduate certificate in regional studies in Asian studies, European and Eurasian studies, and Latin American and hemispheric studies, and topical specialties in international trade policy, international science and technology policy, international security policy, U.S. foreign policy, and political psychology. The program is open to all graduate students presently enrolled in the Elliott School, Columbian College of Arts and Science, the Graduate School of Education and Human Development, the School of Business, and the School of Public Health and Health Services at The George Washington University, and to graduate students from other universities, persons who have already earned a graduate degree, and persons with a bachelor's degree and a minimum of eight years of relevant work experience. Additional information is available in the Elliott School Graduate Admissions office.

Master of International Studies

The Master of International Studies is open only to students in master's degree programs at universities with which the Elliott School has developed special partnerships. Consult the Elliott School for specific requirements.

COLLEGE OF PROFESSIONAL STUDIES

Dean R. Whitaker
Associate Deans A. Eskandarian, M.V. Smith

The College of Professional Studies was established in 2001 to offer degree programs leading to associate's, bachelor's, and master's degrees in professional studies. The College also administers off-campus programs offered by other schools of the University. The staff of instruction for the College includes members of the full-time faculty of the University and academically qualified adjunct faculty from the professional community.

All University off-campus offerings in Maryland are approved by the Maryland State Board for Higher Education; those in Virginia are certified by the State Council of Higher Education for Virginia.

Professional Studies degrees are primarily offered to organizational clients under contract and can be presented in flexible formats, including series of short modules and distance learning. The College also offers a graduate certificate in landscape design for open enrollment. Degree and certificate programs offered by other schools and administered through the College of Professional Studies off-campus division are listed below.

Students wishing to apply for admission to an off-campus degree program may obtain application forms from the school concerned, the College of Professional Studies, or online at www.gwu.edu/~gradinfo.

Columbian College of Arts and Sciences—For degree program information, see the program concerned under Courses of Instruction: Master of Arts in the fields of human resources management and organizational management (see Organizational Sciences), and in the field of legislative affairs; Master of Fine Arts in the field of classical acting (see Theatre and Dance); Master of Forensic Sciences with concentrations in security management and in high-technology crime investigation. In addition, graduate certificates are available in survey design and data analysis, PACs and political management, and leadership coaching; consult the school for requirements.

School of Business—For degree program information, see the section on the School of Business: Master of Business Administration; Master of Science in Information Systems Technology (management information systems); Master of Science in Project Management; Master of Tourism Administration.

School of Engineering and Applied Science—For degree program information, see the section on the School of Engineering and Applied Science: Master of Engineering Management; Master of Science and Doctor of Science in the fields of engineering management and systems engineering. In addition, graduate certificates are available in crisis and emergency management, engineering and technology management, knowledge management, information security management, and systems engineering; consult the school for requirements.

Graduate School of Education and Human Development—For degree program information, see the section on the Graduate School of Education and Human Development: Master of Arts in Education and Human Development in the fields of educational technology leadership, educational leadership and administration, higher education administration, human resource development, and school counseling; Master of Education in the field of secondary education; Education Specialist in the field of educational leadership and administration; Doctor of Education in the fields of higher education administration and educational administration and policy studies.

The dual degree program co[illegible] work. As part of this program, the Elliott School accepts up to 12 credit hours of course work from the School of Public Health and Health Services in fulfillment of its degree requirements. The program takes approximately three years of full-time study for completion.

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Courses

COURSES OF INSTRUCTION

The following section provides listings and descriptions of graduate courses offered by the departments of instruction and interdepartmental programs.

Degree requirements of departments and programs in Columbian College of Arts and Sciences and the Elliott School of International Affairs appear under the department or program heading; degree requirements of the School of Engineering and Applied Science, the Graduate School of Education and Human Development, and the School of Business appear under the respective school's section.

To determine the content of required or prerequisite courses below the 200 level, see the Undergraduate Programs Bulletin.

The number of credit hours given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the title of the course. Thus, a year course giving 3 credit hours each semester is marked (3–3), and a semester course giving 3 credit hours is marked (3). A credit hour may be defined as one 50-minute period of class work or one laboratory period a week for one semester.

Following most course descriptions is a parenthetical statement listing the semester (fall or spring) for which the course is scheduled. The term *academic year* is used only with two-semester courses and indicates that the first half of the course is to be offered in the fall semester and the second half in the spring semester. Not all offerings for the summer sessions are listed in this Bulletin. Students should consult the Summer Sessions Announcement for additional summer offerings. Schedules of Classes are published for the fall and spring semesters and are available online.

The courses as listed here are subject to change. The University reserves the right to withdraw any course announced or to change the course fees shown.

Key to Abbreviations

The following abbreviations are used for course designations. (The list excludes designations for courses limited to students in the School of Medicine and Health Sciences.)

Accy	Accountancy
AmSt	American Studies
Anat	Anatomy
Anth	Anthropology
ApSc	Applied Science
Arab	Arabic
AH	Art History
ArTh	Art Therapy
Astr	Astronomy
Bioc	Biochemistry
BiSc	Biological Sciences
BmSc	Biomedical Sciences
Bios	Biostatistics
BAdm	Business Administration
Chem	Chemistry
Chin	Chinese
CE	Civil Engineering
Clas	Classical Studies
CCAS	Columbian College of Arts and Sciences
Comm	Communication
CSci	Computer Science
Cnsl	Counseling
EES	Earth and Environmental Sciences
Econ	Economics
Educ	Educational Leadership
ECE	Electrical and Computer Engineering
EMda	Electronic Media
EHS	Emergency Health Services
EMSE	Engineering Management and Systems Engineering
Engl	English
EFL	English as a Foreign Language
EnRP	Environmental and Resource Policy
Epid	Epidemiology
EMBA	Executive Master of Business Administration
ExSA	Exercise and Sport Activities
ExSc	Exercise Science
Film	Film Studies
Fina	Finance
FA	Fine Arts
ForS	Forensic Sciences
Fren	French
Gnet	Genetics
Geog	Geography
Ger	German Language and Literature
Grek	Greek

HSci	Health Sciences
HSML	Health Services Management and Leadership
Hebr	Hebrew
Hist	History
HomP	Hominid Paleobiology
Honr	Honors
HDev	Human Development
HRD	Human Resource Development
HmSc	Human Sciences
HmSr	Human Services
Hmn	Humanities
Immu	Immunology
IAff	International Affairs
IBus	International Business
Ital	Italian
Japn	Japanese
Jour	Journalism
Kor	Korean
PSLD	Landscape Design
Latn	Latin
Law	Law
Ling	Linguistics
Mgt	Management Science
Mktg	Marketing
MBAd	Master of Business Administration
Math	Mathematics
MAE	Mechanical and Aerospace Engineering
Micr	Microbiology
Onco	Molecular and Cellular Oncology
MStd	Museum Studies
Mus	Music
NSc	Naval Science
NeuS	Neuroscience
OrSc	Organizational Sciences
Path	Pathology
PStd	Peace Studies
Phar	Pharmacology
Phil	Philosophy
Phys	Physics
Phyl	Physiology
PCm	Political Communication
PMgt	Political Management
PPsy	Political Psychology
PSc	Political Science
Port	Portuguese
PsyD	Professional Psychology
Psyc	Psychology
PAd	Public Administration
PubH	Public Health
PPol	Public Policy
Rel	Religion
Rom	Romance Literatures
SEAS	School of Engineering and Applied Science
SMPA	School of Media and Public Affairs
SLP	Service–Learning Program
Slav	Slavic Languages and Literatures
Soc	Sociology
Span	Spanish
SpEd	Special Education
SpHr	Speech and Hearing
Stat	Statistics
SMPP	Strategic Management and Public Policy
TrEd	Teacher Education
TrDa	Theatre and Dance
TStd	Tourism Studies
Univ	University
UW	University Writing
Viet	Vietnamese
WLP	Women's Leadership Programs
WStu	Women's Studies
Ydsh	Yiddish

Explanation of Course Numbers

Courses numbered 1–100 are planned for students in the freshman and sophomore years. With the approval of the advisor and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisites to advanced courses, but they may not be taken for graduate credit.

Courses numbered 101–200 are planned for students in the junior and senior years. Except for accountancy courses, they may be taken for graduate credit only upon the approval of the dean and the instructor at the time of registration. Such approval is granted only with the provision that students must complete additional work to receive graduate credit. Accountancy courses numbered 101–200 may not be taken for graduate credit.

Courses numbered 201–300 are planned primarily for graduate students. They are open, with the approval of the instructor, to qualified seniors; they are not open to other undergraduates. Qualified seniors in the School of Business registering for these courses must have a 3.0 average, the prior approval of the department chairman who is responsible for the graduate course, and the prior

approval of the dean. Nondegree students who have not completed a bachelor's degree may not enroll in graduate courses offered by the School of Business.

Courses numbered 301–400 in Columbian College of Arts and Sciences and the School of Engineering and Applied Science are limited to graduate students, but they are primarily for doctoral candidates. Courses numbered 301–400 in the School of Business are primarily for doctoral students; the courses are open to selected master's students upon approved petition. In the Graduate School of Education and Human Development courses numbered 301–400 are limited to graduate students with master's degrees from accredited institutions.

Courses numbered 701, 721, and 751 represent an ongoing program of curriculum innovation at GW. Courses numbered in the 770s and 780s are taught by scholars who hold appointments as University Professors. The 700 numbers do not indicate the level of difficulty.

A few courses are numbered in the 400s and 800s to set them apart for administrative reasons; these courses are often analogous to courses numbered in the 200s.

ACCOUNTANCY

Professors C.M. Paik, D.R. Sheldon, W.R. Baber, K.R. Kumar, S.H. Kang
Associate Professors L.G. Singleton, K.E. Smith (*Chair*), L.C. Moersen, F. Lindahl
Assistant Professors C.L. Jones, R.L. Tarpley, L. Liang, S. Hansen, M. Sullivan

See the School of Business for programs of study in accountancy leading to the degrees of Master of Accountancy and Doctor of Philosophy.

201 **Financial Accounting** (2) Sheldon, Singleton
Basic concepts and methods used in financial statements. Use and preparation of the income statement, balance sheet, and statement of cash flows; application of concepts to accounting and reporting issues, including revenue and expense recognition, cash, receivables, inventory, marketable securities, long-lived assets, and debt and equity securities. Same as MBAd 210. (Fall and spring)

202 **Managerial Accounting** (2) Paik, Lindahl
The role of accounting in the decision-making processes of management; understanding of how accounting influences resource allocation decisions in the organization. Prerequisite: Accy 201 or MBAd 210. Same as MBAd 211. (Fall and spring)

211 **Business Law: Contracts, Torts, and Property** (3) Moersen
Essential legal principles of contracts, torts, and property, including trusts and estates, leases, professional liability, and the Uniform Commercial Code. Same as SMPP 211. (Fall)

212 **Business Law: Enterprise Organization** (3) Moersen
The legal aspects of organizing, financing, and operating an enterprise: agency, partnerships, corporations, securities regulation, insurance, suretyship, secured credit financing, and commercial paper. Same as SMPP 212. (Spring)

221 **Cost and Budget Analysis** (3) Paik
An advanced cost analysis course, with emphasis on comparative costs, quantitative techniques for cost data, managerial reporting systems, and manufacturing efficiency studies. Prerequisite: Accy 201 and 202 or MBAd 210 and 211. (Spring)

225 **Financial Reporting Standards** (3) Sheldon, Smith
A critical understanding of the Financial Accounting Standards Board Pronouncements and professional standards for compilation of financial statements. Analysis of alternative accounting treatments by management in financial reporting. Prerequisite: Accy 201 or MBAd 210. (Fall and spring)

251 **International Accounting** (3) Lindahl
A study of international accounting standards with emphasis on accounting for foreign conversion requirements compatible with U.S. accounting standards. Prerequisite: Accy 201 or MBAd 210. (Spring)

261 **Federal Income Taxation** (3) Smith
A study of federal income taxation, covering gross income, deductions and credits, sales and other disposition of property, capital gains and losses, and timing. (Fall and spring)

262 **Federal Income Taxation of Partnerships** (3) Smith
Financial and tax accounting for partnerships; formation and operation, distribution to partners, liquidation, and transfer of partnership interests. S corporations are considered. Prerequisite: Accy 261. (Spring)

263 **Federal Income Taxation of Corporations** (3) Smith
Federal income taxation of C and S corporations, covering formation, capital structure, nonliquidating distributions, complete liquidations, corporate accumulations, and the alternative minimum tax. Prerequisite or concurrent registration: Accy 261. (Fall)

264 **Federal Taxation of Estates and Gifts** (3) Staff
An introduction to the federal taxation of wealth transfers and the income taxation of estates and trusts. Topics include assets that comprise the gross estate, deductions, valuation and liquidity problems, and estate planning. Prerequisite: Accy 261. (Spring)

266 **Financial and Tax Accounting for Corporate Combinations** (3) Smith
Financial and tax accounting for intercorporate investments and corporate acquisitions and for consolidated groups of corporations. Consolidation procedures, accounting for goodwill, intercompany sales, and taxation of the corporations and their shareholders. Prerequisite: Accy 201, 261. (Spring)

275 **Contemporary Auditing Theory** (3) Staff
A comprehensive survey of contemporary auditing as practiced by external auditors (primarily certified public accountants) and internal auditors (those employed within government and corporate entities). Generally accepted auditing standards; government auditing standards. Planning, directing, and reporting on various audits. Prerequisite: Accy 225. (Fall and spring)

276 **Government Accounting and Auditing** (3) Staff
Government budgeting, accounting, financial reporting, and auditing required of state and local governments, nonprofit organizations, and colleges and universities. The financial management practices and auditing requirements applicable to private and public sector organizations receiving governmental financial assistance and those subject to governmental audits. (Summer)

282 **Accounting Information Systems and EDP** (3) Staff
Development and application of accounting system theory, including analysis, design, control concepts, and implementation. Integration of electronic data processing, accounting systems, and management information systems. Prerequisite: Accy 201 or MBAd 210. (Fall)

290 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit. (Fall and spring)

291 **Financial Statement Analysis** (3) Kang
Analysis and interpretation of financial statements for managers, stockholders, creditors, and financial analysts; ratio-driven financial analysis: earnings-based and cash-flow-based equity valuation; sales and EPS forecasting; preparation of projected financial statements. Prerequisite: Accy 201, MBAd 250. (Fall and spring)

298 **Directed Readings and Research** (1 to 3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

391 **Doctoral Seminar** (arr.) Baber, Kang, Kumar, Lindahl
Reasoning and research in technical areas of accounting; theoretical issues and their application to practice; conceptual themes in professional literature; comparative accounting research analyses. (Fall and spring)

397 **Doctoral Seminar** (1 to 3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

AMERICAN STUDIES

Professors B.M. Mergen, J.O. Horton, J.M. Vlach, R.W. Longstreth, J.A. Miller, P.M. Palmer (*Chair*), M. Knight
Associate Professors T.A. Murphy, M. McAlister
Assistant Professor C. Heap
Adjunct Associate Professors E. Mayo, P.J. Cressey
Associate Professorial Lecturers R.D. Wagner, O. Ridout, F. Goodyear

Master of Arts in the field of American studies—Prerequisite: the degree of Bachelor of Arts in American studies or a related field.

Required: the general requirements stated under Columbian College of Arts and Sciences, including (1) AmSt 231; (2) 21 credit hours chosen in a carefully related pattern of study of American civilization that includes at least one research seminar; (3) a comprehensive examination covering general competence in American studies and the candidate's area of concentration; (4) a thesis (6 credit hours) written on a topic approved by the student's advisor or, with permission of the advisor and the director of the program, 12 credit hours of additional course work, 6 of which must be research oriented. Special concentrations in the master's degree program include the following.

1. *A concentration in museums and material culture*—Course emphasis on the use of artifacts in historical research, offered in association with the Smithsonian Institution. Required in addition to the general requirements outlined above: AmSt 250. Recommended: courses in decorative arts, architectural history, historical archaeology, history of technology, history of art, and folklife. Programs specific to museum studies and museum education are also available.
2. *A concentration in historic preservation*—Course emphasis on interpreting issues in historic preservation through a humanistic framework. Prerequisite: a course in American architectural history. For this concentration, the general requirements outlined above are amended as follows. Required: 36 credit hours, consisting of 12 hours of American studies courses including AmSt 231 and at least one research seminar; 18 hours of historic preservation courses including AmSt 277–78; an optional thesis (6 hours) or two additional electives. A comprehensive examination, as outlined above, is required.
3. *A concentration in folklife*—Course emphasis on the expressive culture of American folk societies and theories and methods for their evaluation and interpretation. Required in addition to the general requirements outlined above: AmSt 256, 257. Recommended: courses in topics related to folklife, such as regionalism, oral history, material culture, vernacular architecture, and social and cultural history.

Doctor of Philosophy in the field of American studies—This program combines work in the humanities and/or social sciences as preparation for careers in a range of institutions, including universities, museums, archives, libraries, preservation offices, and related public and private enterprises. Applicants are required to have an adequate background in the humanities and/or social sciences as they apply to the understanding of American studies.

Required: the general requirements stated under Columbian College of Arts and Sciences and successful completion of a reading knowledge examination in an approved foreign language. All students must take AmSt 231 and a research seminar approved by the advisor. Candidates must pass a General Examination in three areas, to be taken over the course of one month, by the end of the third year from matriculation. The three fields are elected with approval of the advisory committee; one field may represent foreign coverage. Other areas may be chosen from American diplomatic, economic, political, social, cultural, or urban history; folklife, literature, art, philosophy, or religion; popular culture, cultural theory, mass media; race studies; African American or women's/gender history; historic preservation; or some areas of the social and behavioral sciences. In affiliation with the Smithsonian Institution, possible topics include aerospace history, decorative arts, ethnohistory, history of science, history of technology, industrial archaeology, material aspects of American civilization, and various fields in the history of art. Additional areas of study may be arranged within the University and in both the Library of Congress and the Smithsonian.

Research fields for the dissertation may be chosen from any of the above except those dealing with the culture of an area outside the United States.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

220 **Fundamentals of Feminist Theory** (3) Palmer
Same as WStu 220.

226 **U.S. Media and Cultural History** (3) McAlister
History and analysis of the 20th-century U.S. media and culture, including film, television, and literature, with a focus on primary texts. The construction of identities in the context of modernism, mass culture, and globalization. Linked to lecture for AmSt 181, with graduate section. Same as Hist 226.

231 **Seminar: Scope and Methods in American Studies** (3) Murphy
Consideration of American studies as an area for research and teaching; introduction to bibliography. Required of candidates for the degree of Master of Arts in the field of American studies. (Fall)

232 **Cultural Theory and American Studies** (3) McAlister
Major issues in critical and cultural theory as they relate to American culture. Various interpretive approaches including discourse analysis, cultural studies, new historicism, anthropological theory, etc. Prerequisite: AmSt 231 or permission of instructor. (Spring, alternate years)

244 **Sexuality in U.S. History** (3) Heap
Examination of the changing social organization and meaning of sexual practices and desires in American culture, with particular attention to the relationship between sexuality and gendered racial and class identities and politics. Linked to lecture for AmSt 130, with graduate section. Same as Hist/WStu 244.

256 **Folklore Theory** (3) Vlach
An intellectual history of American folklore research; analysis of particular theories and methods. Same as Anth 296. (Spring)

257 **Seminar: American Folklife** (3) Vlach
Research and discussion on the traditional cultures of various geographical regions of the United States. Analysis of folk art, craft, and architecture; regional and ethnic identities. Same as Anth 297. (Fall)

259 **Topics in American Folklife** (3) Staff
A seminar devoted to a variety of subjects related to folklore and folklife, such as public folklore policy, folk music, or ethnic folklore and culture. Specific topic to be determined by the interests of available faculty and the needs of the folklife program.

262 **The United States in a Global Context** (3) McAlister
Analysis of the cultural constructions of the nation and international power, comparing the context of the 18th and 19th century, European colonialism, and U.S. expansion in the 20th century. The role of literature and mass media in furthering the logic of globalization. Readings are both theoretical and historical.

268–69 **Readings and Research in American Cultural History** (3–3) McAlister, Murphy
Studies in the cultural history of the United States, focusing on major historiographic debates and interventions. Topics include: cultural contact, colonialism, the public sphere, the rise and dissemination of mass media, consumer culture, systems of religious and political belief, gender relations, and racial formations. Same as Hist 268–69. (Alternate years)

270 **Theory and Practice of Public History** (3) Horton
Theoretical and practical dimensions of public history, as illustrated by recent controversies surrounding public exhibitions and debates on revisionist history as well as more traditional means of presenting the past in public forums. Same as Hist 270.

271–72 **Readings/Research Seminar: U.S. Social History** (3–3) Horton
AmSt 271: Readings seminar on American daily life, institutions, and intellectual and artistic achievements. AmSt 272: Research seminar. AmSt 271 is prerequisite to AmSt 272. Same as Hist 271–72.

273 **Readings on Women in American History** (3) Harrison
Same as Hist/WStu 273.

275 **The Politics of Historic Preservation** (3) Staff
Overview of the political issues, forces, events, and players that have shaped contemporary preservation practice, with an emphasis on public policy issues that have not been resolved and continue to confront preservation objectives. Prerequisite: Permission of instructor. (Spring)

276 **Economics of Preservation** (3) Wagner
Analysis of economic techniques and benefits used to encourage the retention and reuse of historic buildings and districts in the United States. Emphasis on revitalization of older commercial centers and the Mainstreet program. Prerequisite: Permission of instructor. (Spring)

277–78 **Historic Preservation: Principles and Methods** (3–3) Longstreth
The scope and purpose of the preservation movement in the United States, with focus on developments since the 1960s. Preservation theories, attitudes toward the past and toward design, the intent and impact of legislation, approaches to documentation, the concept of significance, and preservation as an instrument of change. Same as Hist 277–78. (Academic year)

280 **Field Methods in Architectural Documentation** (3) Ridout
In-depth thematic examination of cultural landscape, focusing on field techniques for recording, analysis, and interpretation of historic properties. Work at field sites is supplemented by lectures, discussion, and readings. (Fall)

282 **Seminar in American Architecture** (3) Longstreth
Advanced research problems addressing artistic, cultural, social, technical, and urbanistic aspects of American architecture in the 19th and 20th centuries. Topics vary. Prerequisite: AmSt 175 or 176 or equivalent, or permission of instructor. (Spring, alternate years)

286 **Interpretation in the Historic House Museum** (3) Stapp
Same as Educ 286.

287 **U.S. Urban History** (3) Heap
History of American urban life and culture from the Colonial era to the present, focusing on the transitions from pre-industrial to industrial and post-industrial forms, the social and spatial configuration of U.S. cities, and the urban politics of race, class, and gender. Linked to lecture for AmSt 186, with graduate section. Same as Hist 287.

289–90 **Seminar: Topics in American Studies** (3–3) Staff
Research problems selected by the instructor. Preparation in American cultural history or other area appropriate to the topic of the seminar.

294 **Archaeology Field/Laboratory Research** (3) Staff
Same as Anth 284.

295 **Independent Study** (arr.) Staff
Limited to master's candidates. Written permission of instructor required.

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

Courses Offered in Affiliation with the Smithsonian Institution

Columbian College of Arts and Sciences is affiliated with the Smithsonian Institution's Program for Graduate Students in the History of American Civilization. The following courses are offered at the National Museum of American History and at the National Portrait Gallery by members of their staffs.

250 **American Material Culture** (3) Mayo
Familiarization with the historical collections of the Smithsonian Institution and introduction to opportunities for research and publication based on historical objects. Required of all students in the master's and doctoral programs affiliated with the Smithsonian Institution. (Fall)

251 **Museum Research and Education** (3) Mayo
Supervised work and/or study under the direction of Smithsonian staff members and research associates—examples of topics are museum visitor behavior, costumes and furnishings, decorative arts, and photography as historical documentation. (Fall and spring)

252–53 **American Decorative Arts** (3–3) Staff
Concepts of visual recognition and evaluation of surviving domestic artifacts from the 17th, 18th, and 19th centuries, including those made of wood, clay, glass, metal, and cloth. AmSt 252 is prerequisite to AmSt 253. (Academic year)

284 **Seminar: Studies in American Art and History** (3) Goodyear
Selected problems and themes in American cultural history involving the use of artistic materials in different media; emphasis on methodology and analytic techniques. May be repeated for credit.

394 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination in fields offered in affiliation with the Smithsonian Institution. May be repeated for credit.

395 **Dissertation Research** (arr.)
For Doctor of Philosophy candidates preparing dissertations significantly related to the material aspects of American civilization. Students work under curatorial supervision at the Smithsonian Institution. May be repeated for credit.

ANATOMY AND CELL BIOLOGY

The Department of Anatomy and Cell Biology offers the courses listed below in support of basic science programs offered by Columbian College of Arts and Sciences.

Departmental prerequisite: Faculty approval is required for all courses.

210 **Gross Anatomy** (5)
Regional dissections of adult cadaver supplemented with lectures and X-rays.

212 **Neurobiology** (3)
An integrated survey of the structure and function of the human nervous system; lecture, clinical demonstration, and laboratory. Laboratory fee, $25.

213 **Human Microscopic Anatomy** (4)
Microscopic structure of cells, tissues, and organs of the human body.

221–22 **Special Topics in Stem Cell Biology** (1 to 3 each)
Presentations, discussions, and student-oriented projects that relate to stem cell biology.

252 **Human Variation** (1)
Same as Anth 146.

276 **Advanced Studies in Anatomy** (1)
Individualized study of selected anatomical subspecialties. May be repeated for credit.

277 **Special Topics in Neurobiology** (1 to 3)
Selected topics regarding the structural and functional organization of the nervous system. May be repeated for credit.

ANTHROPOLOGY

Professors A.S. Brooks (*Chair*), C.J. Allen, J.M. Vlach, D. Gow, B. Wood, J.C. Kuipers, B.D. Miller, D. Bell, R.R. Grinker, W.J. Frawley, P.W. Lucas
Associate Professor E.H. Cline
Assistant Professors S.C. Lubkemann, B.G. Richmond
Instructor R.M. Bernstein
Adjunct Associate Professor P.J. Cressey
Professorial Lecturers D.H. Ubelaker, R. Potts, G. Teleki, R. Shepherd
Associate Professorial Lecturers J. Love, R. Albro
Assistant Professorial Lecturer S. Johnston

Master of Arts in the field of anthropology—Prerequisite: a bachelor's degree; a major in anthropology is preferred but not mandatory. The undergraduate program should have included courses above the introductory level in anthropological theory, social organization, linguistics, archaeology, and biological anthropology. Students with less background in anthropology may be admitted but may be required to take one or more undergraduate courses to make up deficiencies before beginning the degree program.

1. *General degree*—Required: the general requirements stated under Columbian College of Arts and Sciences. The minimum requirement consists of 36 credit hours of approved graduate course work, generally including a thesis (Anth 299–300). Under certain circumstances, however, the department may permit a program of study that substitutes an internship or independent research for a thesis. Anth 202 should be included in the program of study and completed during the first academic year of graduate work. In addition to Anth 202, students must pass at least one 3-hour course in each of the other three fields of anthropology (biological and linguistic anthropology and archaeology) with a grade of *B* or better. Students who have completed analogous upper-level undergraduate

course work with a grade of *B* or better may request a waiver. Waivers may be by examination. For students with fewer than four undergraduate semesters of one major foreign language, a reading knowledge examination in a major foreign language must be passed before beginning the third semester of graduate work. All students must pass a Master's Qualifying Examination in each of the four fields and an approved methods course.

2. *With a concentration in museum training*—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study is the same as that described for the general degree, above, but must include from 12 to 15 credit hours of work in museum-related courses, 6 credit hours of which may be in an internship. No thesis is required. Students whose primary interest is in museum techniques, rather than anthropology, are advised to apply to the master's program in museum studies (see Museum Studies). A program in museum education is also available through the Graduate School of Education and Human Development.

3. *With a concentration in folklife*—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study is the same as that described for the general degree, except that 6 hours of folklife core courses (Anth 296 and 297) are also required.

4. *With a concentration in international development*—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study is the same as that described above for the general degree, with the following exceptions: this is a 36-credit-hour nonthesis program, including Anth 220 and 223; six hours chosen from Anth 221, 222, 224, 250, 251, 257; and an approved graduate-level course in quantitative analysis. In some circumstances a thesis may be allowed. The program is designed to improve the student's understanding of development problems, such as economic change, population, health, education, migration, and ecology, within an anthropological framework. Internships at public and private development agencies in the Washington area are encouraged. The Elliott School of International Affairs offers a program in international development studies, with a disciplinary specialization in anthropology.

Master of Science and Doctor of Philosophy in the field of hominid paleobiology—see Hominid Paleobiology.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Proseminar in Biological Anthropology** (3) Richmond, Wood
Comprehensive overview of theory and practice in biological anthropology.

202 **Proseminar in Sociocultural Anthropology** (3) Lubkemann, Grinker
Comprehensive overview in theory and practice in sociocultural anthropology.

203 **Method and Theory in Archaeology** (3) Staff
Survey of the most recent archaeological techniques and theoretical approaches to reconstructing and interpreting the cultures of the past.

204 **Proseminar in Linguistic Anthropology** (3) Kuipers
Contemporary anthropological studies of language in biological, social, and historical perspectives. (Spring)

214 **Paleoanthropological Field Program** (3 or 6) Brooks
Intensive course on field research in paleoanthropology, including excavation methods, identification and analysis of materials, paleoecology, archaeology, and human anatomy. Conducted at selected sites in Eurasia, Africa, or Australia. Visits to comparative sites and collections in the region. (Summer)

220 **The Anthropology of Development** (3) Miller, Gow
Theoretical perspectives that distinguish the contribution of anthropology to understanding processes of change in the Third World. Focus on health, population, environment, gender, and tourism issues. The role of anthropology in planning and implementing projects and policy. (Fall)

222 **Issues in Development** (3) Miller, Gow, and Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

223 **Research Methods in Development Anthropology** (3) Miller, Gow
Anthropologists' roles in multidisciplinary teams, including research-related activities, such as feasibility studies, social soundness analysis, and evaluations. Innovative research techniques, such as interactive data gathering, team survey methods, and rapid rural appraisal. Admission by permission of instructor. (Spring)

224 **Internship in Development Anthropology** (3) Miller, Gow
Supervised participation in a selected development agency or other relevant organization. Opportunity to observe agency procedures and gain practical experience. Admission by permission of instructor or department chair. (Fall, spring, and summer)

230 **Anthropology in the Museum** (3) Staff
Anthropological materials (in the broadest sense), exhibits, and museums. Topics include museum anthropology, collections, research, interpretation, and education, with a focus on the practical problems of developing an anthropological exhibit hall.

231 **Museums and the Public: Exhibiting Culture** (3) Staff
Study of the issues and problems involved in "exhibiting culture," past and present, including issues of representation, message and interpretation, audience, ownership of objects and symbols, and ways of reconstructing the past. Visits to and critical examination of local museum exhibits. Transportation fee charged.

232 **Museum Preventive Conservation I** (3) Staff
Same as MStd/AH 232.

233 **Museum Preventive Conservation II** (3) Staff
Same as MStd/AH 233.

234 **Problems in Conservation** (3) Staff
Individual conservation projects to determine composition, construction, decomposition of materials, and possible stabilization techniques. Conservation laboratory experience. Prerequisite or concurrent registration: AH or Anth 232.

236 **Internship in Museum Anthropology** (1 to 6) Staff
Supervised individual research and/or field work at the Smithsonian Institution or other area museums, arranged in consultation with the museum and the Anthropology Department. Admission by arrangement with the department chair or museum training advisor. May be repeated for credit up to a maximum of 6 credits. (Fall and spring)

237 **Ethics and Cultural Property** (3) Staff
Survey of ethical issues in anthropology, focusing on cultural property and repatriation; the epistemological, ethical, and political dilemmas of excavating, collecting, and owning cultural artifacts. (Spring)

241 **Human Functional Anatomy** (3) Richmond
Growth and function of the musculoskeletal system, including the development, anatomy, and histology of bone, biomechanics of muscle and skeletal tissue, craniofacial and dental growth and morphology, and locomotion. No prior knowledge of anatomy required. Laboratory fee, $50. (Spring)

244 **Analytical Methods in Human Evolutionary Studies** (3) Richmond
A survey of methods and approaches for data collection and analysis in human evolutionary biology research. Topics include comparative methods and basic and multivariate statistics.

247 **Paleoanthropology** (3) Brooks, Wood, Potts
Survey of current research in hominid and hominoid evolution, focusing on the integrated nature of the field. Contributions from the geological and biological sciences will be stressed, together with innovative geochemical techniques for establishing chronological sequences. Prerequisite: Anth 147 or BiSc 150 or equivalent. (Spring)

249 **Topics in Biological Anthropology** (3) Staff
Topic announced in the *Schedule of Classes*. Instructors will be drawn from GW faculty and Smithsonian Institution staff. May be repeated for credit if topic varies.

250 **Nationalism and Ethnicity** (3) Grinker
Major theoretical and ethnographic issues in the study of nationalism worldwide. Explores how ethnic groups emerge in colonial and contemporary plural societies and how states attempt to integrate ethnic groups into nations. (Fall, alternate years)

251 **Anthropology and Contemporary Problems** (3) Staff
Exploration of anthropological perspectives on a current issue, such as refugees, ethnic violence, national mythologies, and women's health in developing countries. Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

254 **Medical Anthropology** (3) Miller
Concepts of medical anthropology, including the cultural construction of illness, the somatic expression of distress, and ethnopsychiatries; "critical" versus "conventional" medical anthropology. (Fall)

257 **Gender and Sexuality** (3) Bell
Study of new theoretical and methodological approaches developed in the anthropology of gender. Topics include postcolonialism, sexuality, and literary representations of gender. (Fall, odd years)

258 **Anthropology of Art, Aesthetics, and Symbolism** (3) Allen
Anthropological approaches to aesthetic problems and theories of symbolism in the context of ethnographic materials. (Fall, alternate years)

259 **Topics in Sociocultural Anthropology** (3) Allen and Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit if the topic varies.

269 **Topics in Linguistic Anthropology** (3) Kuipers and Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit if the topic varies.

272 **Anthropology of Latin America** (3) Allen and Staff
Intensive study of a selected topic in the anthropology of Central and/or South America. Topic to be announced.

282 **Advanced Archaeology—New World Prehistory** (3) Staff
Current archaeological problems relating to the origin and development of aboriginal cultures. Specific topic to be announced in the *Schedule of Classes*. May be repeated for credit.

283 **Old World Prehistory** (3) Brooks and Staff
Current problems in relation to materials from the Old World. Specific area to be announced in the *Schedule of Classes*. (Spring)

284 **Archaeology Field/Laboratory Research** (3) Cressey, Brooks
Same as AmSt 294. Field and/or laboratory techniques and interpretation. Topics may include excavation methods, recording, photography, conservation, stratigraphy, environmental reconstruction, typology, ceramic analysis, use–wear analysis, spatial analysis, faunal analysis, provenance studies, and dating. May be repeated for credit. Laboratory fee, $25.

286 **Technology** (3) Staff
Cross-cultural examination of the form, function, meaning, and use of material culture and the behavior patterns involved in its production.Topic announced in the *Schedule of Classes*.

289 **Topics in Archaeology** (3) Staff
Major issues related to the theory and practice of archaeology. Topic announced in the *Schedule of Classes*.

295 **Research** (arr.) Staff
May be repeated for credit.

296 **Folklore Theory** (3) Vlach
An intellectual history of American folklore research; analysis of particular theories and methods. Same as AmSt 256. (Spring)

297 **Seminar: American Folklife** (3) Vlach
The materials of American folk culture, concentrating on folk architecture, crafts, and art. Major organizing themes are regionalism and the use of objects as indicators of cultural intention. Same as AmSt 257. (Fall)

299–300 **Thesis Research** (3–3) Staff

APPLIED SCIENCE

Interdepartmental course offerings in the School of Engineering and Applied Science.

211 **Analytical Methods in Engineering I** (3) Whitesides, Haque
Engineering applications of the theory of complex variables: contour integration, conformal mapping, inversion integral, and boundary–value problems. Prerequisite: approval of department. (Fall)

212 **Analytical Methods in Engineering II** (3) Mavriplis, Haque
Algebraic methods appropriate to the solution of engineering computational problems: linear vector spaces, matrices, systems of linear equations, eigenvalues and eigenvectors, quadratic forms. Prerequisite: approval of department. (Spring)

213 **Analytical Methods in Engineering III** (3) Haque, Whitesides
Analytical techniques for solution of boundary–initial-value problems in engineering: wave propagation, diffusion processes, and potential distributions. Prerequisite: approval of department. (Fall)

214 **Analytical Methods in Engineering IV** (3) Haque
Introduction to variational methods in engineering: Ritz and Galerkin approximation methods of boundary–value problems, aspects of linear integral equations arising from engineering analysis. Prerequisite: approval of department. (Spring, even years)

215 **Analytical Methods in Engineering V** (3) Whitesides, Haque
Advanced methods of solution of boundary–initial-value problems in engineering: characteristics, wave propagation, and Green's functions. Prerequisite: ApSc 213. (Fall, odd years)

216 **Special Topics in Engineering Analysis** (3) Whitesides, Haque
Selected topics, such as perturbation techniques applied to approximate solution of nonlinear boundary and initial-value problems in engineering; application of singular integral equations in problems of mechanics. Prerequisite: approval of department. (As arranged)

ART

See **Fine Arts and Art History.**

ART THERAPY

Assistant Professors A. Mills (*Director*), S. Talwar
Adjunct Associate Professors E. Kramer, A. Di Maria, B. Sobol
Associate Professorial Lecturer P. Howie
Lecturers D. Brancheau, T. Tripp, C. Doby-Copeland, T. Svat, H. Bardot, L. Milofsky
Clinical Instructors T. Councill, L. Diamond-Raab, E. Knight, S. Thomas, E.J. Endler, L.R. Garlock, K. Hanrahan-Havern, M.J. Kehne, R. Tanksley, M. Urbia

Master of Arts in the field of art therapy—Prerequisite: a bachelor's degree, evidence of significant training and/or experience in art, including painting, drawing, and clay modeling; course work in the behavioral and/or social sciences, including personality theory, abnormal psychology, and child psychology.

Required: the general requirements stated under Columbian College of Arts and Sciences and successful completion of 45 credit hours of graduate course work. At least 24 credit hours must be in art therapy and must include ArTh 201, 203, 205–6 or 207 and 208, 224–25, 283–84, and 293–94.

Fields of emphasis: adult art therapy, family art therapy, child art therapy, and research. Students wishing to extend their training to the doctoral level are encouraged to apply to the Doctor of Psychology program. See Professional Psychology.

A certificate program is available to those who have earned or are currently enrolled in a graduate program in a related field.

Note: The following courses are open to non-art therapy students with permission of the instructor or program director: ArTh 202, 204, 205–6, 207, 208, 211, 220, 228, 275, 280, 289.

201 **Introduction to Art Therapy** (3) Brancheau
Overview of theoretical approaches in art therapy, based on recognized theories of personality. Developmental stages of artwork; normal and abnormal personality characteristics; defense mechanisms in artwork. Ethical considerations and standards of practice. Open only to art therapy students. (Fall)

202 **Case Studies** (3) Di Maria
Organization of case material for presentation in various clinical settings. Videotaping of presentations, with peer and instructor feedback. Case management procedures. Psychiatric and medical terminology used in case documentation. Writing a formal case study and a variety of progress notes. (Spring)

203 **Technique of Art Therapy** (3) Mills
Art therapy approaches involving understanding of abnormal behavior and the needs of patients with diverse diagnoses and cultural backgrounds. How the language and process of art effect change or promote insight. Theories of coun-

seling and psychotherapy. Ethical issues and standards of practice. Written and clinical assignments. Open only to art therapy students. (Fall)

204 **Psychodynamic Processes** (3) Kramer, Howie
Concepts of instinctual drives, ego development, mechanisms of defense, sublimation, transference and countertransference, maturation and regression applied to work with children, adults, families, and groups. (Spring)

205–6 **Principles and Practice of Art Therapy with Families** (3–3) Sobol, Howie
Principles of work with families, including various theoretical approaches to the family system, cultural issues, and ethical considerations. The use of art techniques for evaluation of family dynamics. Observation and conduct of family art evaluations in clinical settings. (Fall and spring)

207 **Principles and Practice of Art Therapy with Children** (3) Di Maria
Practical and theoretical considerations involved in treating children, with focus on child development (including the development of artistic expression), methods of evaluation (including those using art materials), psychodynamic processes, and the array of issues arising in individual and group work. (Spring)

208 **Principles and Practice of Art Therapy with Adolescents** (3) Brancheau
Practical, theoretical, and ethical considerations involved in treating multicultural adolescents in clinical and educational settings, with focus on typical and psychopathological stages of adolescent and artistic development. Assessment and treatment issues integrating the use of art techniques specifically designed for this population. (Spring)

211 **Survey of Art Therapy** (3) Svat
Use of visual arts to enhance personal development; history, theories, range of practice in art therapy. Illustrated lectures, reading, discussion, studio work. Not intended for art therapy degree candidates. Open to advanced undergraduates with permission of instructor. (Fall)

220 **Research Methods** (3) Mills
Research design, methodology, and relevant research models, including basic statistics. Ethical principles, such as those related to the researcher's sensitivity to cross-cultural issues, and working as a researcher with vulnerable populations, such as children or people with disabilities. Individual art therapy pilot studies are designed. (Spring)

224–25 **Therapeutic Process** (3–3) Talwar
Theoretical and clinical dimensions of counseling explored through study of current research in therapy, reading and discussion of multicultural elements affecting the therapeutic process, and videotaping on site and in the classroom. Individual, group, and systems issues affecting the therapeutic encounter. Open only to art therapy students. (ArTh 224: spring; ArTh 225: fall)

228 **Art and Diagnosis** (3) Tripp
This course reviews the *Diagnostic and Statistical Manual* as well as relevant literature pertaining to psychiatric diagnosis. Ethical issues. Cultural and environmental influences on diagnostic categorization. Viewing art productions by specific diagnostic populations. Art therapy research related to diagnosis. (Spring)

275 **Group Process** (3) Tripp
Group psychotherapy theory, techniques, and practices studied through lectures, discussion, and participation in a group experience. Theories relating to developmental stages, role assumption, leadership style and its effect on the group, and ethical and cultural issues particular to group therapy. The relationship of art to the group process. (Summer)

280 **Assessment Procedures** (3) Bardot, Milofsky
Assets, limitations, ethics, and procedures involved in psychological assessment. Wechsler, Bender, Rorschach, Thematic Apperception Tests, and projective drawing tests. Administration and interpretation of standardized assessments in the art therapy field, to develop an ability to analyze form and content of pictorial and sculptural work for clinical and diagnostic purposes. (Fall)

283–84 **Practicum in Art Therapy** (1–2) Staff
The sequence of ArTh 283–84 and 293–94 requires a minimum of 1100 hours of clinical fieldwork in a professional setting (psychiatric and medical hospitals, community mental health centers, geriatric facilities, residential treatment

settings, and schools). On-site individual supervision and group supervision by departmental staff. Open only to art therapy students.

285 **Special Projects in Art Therapy** (arr.) Staff
Individual work based on research. Empirical, clinical, and library research may be undertaken, as well as the development of new procedures. Details to be worked out with each student. May be repeated for credit with advisor's approval. Open only to art therapy students. (Fall and spring)

289 **Special Topics** (1 to 3) Staff
Connections between art therapy and other disciplines; new developments in the field. May be repeated for credit with approval of advisor. Past topics have included Honoring Diversity and The Artist as Therapist.

293–94 **Practicum in Art Therapy** (2–1) Staff
Continuation of ArTh 283–84. Open only to art therapy students.

ASIAN STUDIES

Program Committee: S. McHale (*Director*), B. Dickson, S. Hamano, J. Kuipers, K. Larsen, E. McCord

Master of Arts in the field of Asian studies—The Elliott School of International Affairs offers a multidisciplinary program leading to the Master of Arts in the field of Asian studies.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a bachelor's degree in a related field. Entering students who have not completed undergraduate course work in modern Chinese and Japanese history must take equivalent course work at the beginning of their program.

Required: the general requirements stated under the Elliott School of International Affairs. The program requires a minimum of 40 credit hours, with a thesis or non-thesis option. Students electing the thesis option will complete 6 credit hours of thesis research. Students are required to organize their course work into at least three fields and successfully complete a capstone policy course during their last spring semester in residence. Each student's program of study must include course work on more than one Asian country, as well as course work in a minimum of three of the following disciplines: economics, history, literature, political science, and sociology. Students should consult the program guidelines available from the Elliott School about specific courses in these fields of study. Students may also choose a non-Asia-related field (e.g., international business) after approval in advance by the program director. Students must pass a capstone course and three 1-credit skills-based courses. More details are provided in the program guidelines available in the Elliott School.

Students must demonstrate an oral and reading knowledge of Chinese, Japanese, or another approved Asian language by passing a proficiency examination during their final 18 hours in residence. Six hours of language course credit may apply toward degree requirements.

BIOCHEMISTRY AND MOLECULAR BIOLOGY

Professors J.M. Bailey, A.L. Goldstein (*Chair*), L.L. Gallo, A. Kumar, G. Walker, J.Y. Vanderhoek
Associate Professors V. Hu, P. Berg, F. Kashanchi, T. McCaffrey

Master of Science in the field of biochemistry—Prerequisite: a bachelor's degree. The undergraduate program must have included the following courses, or equivalent: BiSc 11–12; Chem 11–12, 22, 151–52, 153–54; Phys 1, 2.

Required: the general requirements stated under Columbian College of Arts and Sciences, including Bioc 221–22, 223 or 224, 234, and the Comprehensive Examination. Students may choose a 30-credit thesis option or a 36-credit nonthesis option.

Master of Science in the field of genomics and bioinformatics—This degree program is offered by Columbian College of Arts and Sciences in cooperation with the School of Medicine and Health Sciences and the School of Engineering and Applied Science. Consult the Department of Biochemistry and Molecular Biology or the Department of Microbiology and Tropical Medicine for program requirements.

Doctor of Philosophy in the field of biochemistry—Required: the general requirements stated under Columbian College of Arts and Sciences, including the biomedical sciences

core curriculum, Bioc 225, 227, 234, 236–37, 250, 252, 254; BiSc 228; and the General Examination.

Research fields: endocrinology—thymosins, signaling pathways, eicosanoids; viral gene regulation; antiviral chemotherapy; immunology—immunochemistry, viral gene transactivation; lipids and membranes—essential fatty acids, membrane biochemistry, complex lipids, cholesterol; radiation biology—carcinogenesis, apoptosis; molecular biology of cancer—breast cancer, leukemia, homeobox genes; genomics and proteomics—vascular biology, gene array technology, lipoproteins, atherosclerosis, HIV-1 and other human retroviruses.

221–22 **General Biochemistry** (4–4) Gallo and Staff
A comprehensive course in general biochemistry for graduate students in biomedical sciences and undergraduate students in biology and chemistry. Prerequisite: Chem 152, 154. (Academic year)

223 **Biochemical Techniques** (3) Vanderhoek
Lectures cover basic laboratory techniques used in contemporary biochemical and molecular biological research. (Fall)

224 **Biochemical Techniques Laboratory** (3) Vanderhoek
Common laboratory techniques used in life science laboratories to separate and characterize macromolecules, including chromatography, gel electrophoresis, immunoassays, spectroscopy, and centrifugation. Corequisite: Bioc 221. Laboratory fee, $75. (Fall)

225 **Metabolism** (4) Gallo and Staff
Metabolic pathways and integration of metabolic processes. Limited to Ph.D. students in the Institute for Biomedical Sciences.

227 **Biochemistry Seminar** (1) Hu and Staff
Current literature in biochemistry. Limited to graduate students in the department. May be repeated for credit. (Fall and spring)

230 **Topics in Protein Chemistry and Enzymology** (2) Hu and Staff
Directed readings in various areas of enzymology. Enrollment limited to graduate students in the department. May be repeated for credit. Prerequisite: Bioc 234.

234 **Structure and Function of Proteins and Enzymes** (3) Hu and Staff
Structure–function relationships of proteins, enzyme kinetics, regulation and reaction mechanisms, and other special topics. Prerequisite: Bioc 221. (Spring)

235 **Current Topics in Bioenergetics** (1 or 2) Staff
Directed readings in various areas of bioenergetics. Enrollment limited to graduate students in the department. May be repeated for credit. Prerequisite: Bioc 222.

236–37 **Fundamentals of Genomics and Proteomics** (2–2) McCaffrey and Staff
Genomic theories, methods, and data analysis including bioinformatics and database mining. Proteomic methods, including two-dimensional gels, image analysis, and protein identification. Same as Micr 236–37. Prerequisite or corequisite: Bioc 221–22 or BmSc 210, 211; Bioc/Micr 236 is prerequisite to Bioc/Micr 237.

240 **Nutrition** (2) Walker and Staff
Content includes discussion of RDA, nitrogen balance, vitamins and minerals, diets, and other special topics. Prerequisite: Bioc 201 or 221–22. (Spring)

250 **Molecular Biology** (3) Kumar and Staff
Content includes the organization and replication of genetic material, transcriptional and translational machinery, regulation of eukaryotic gene expression, and other special topics. Prerequisite: Bioc 201 or 221–22. (Fall)

251 **Current Topics in Molecular Biology** (1 or 2) Kumar and Staff
Directed readings in the area of molecular biology. May be repeated for credit. Enrollment limited to graduate students in the department; others may enroll with approval of instructor. Prerequisite: Bioc 250. (Spring)

252 **Biochemical and Molecular Aspects of Selected Diseases** (2) Kumar and Staff
Emphasis on the biochemical and molecular aspects of selected diseases. The format will be of a tutorial type, including presentations of material by students. (Spring, odd years)

254 **Fundamentals of Molecular Biology** (3) Berg and Staff
An intermediate-level molecular biology survey course. Prerequisite: Bioc 221 or BmSc 211.

260 **Biochemistry of Lipids and Membranes** (2) Vanderhoek
Biochemistry, structure, and function of various lipid classes, membranes, and receptors. Prerequisite: Bioc 221–22. (Spring, even years)

261 **Current Topics in Lipids** (1 or 2) Gallo, Vanderhoek, and Staff
Directed readings in the area of lipid biochemistry. May be repeated for credit. Enrollment limited to graduate students in the department.

262 **Lipoproteins** (2) Gallo
Composition, synthesis, and metabolism of lipoproteins in normal and dyslipoproteinemic subjects. Prerequisite: Bioc 221–22. (Spring, odd years)

266 **Cellular Biology** (3) Vanderhoek and Staff
Structure and function of cellular membranes, cytoskeleton, subcellular organelles, cellular bioenergetics, and intercellular interactions. Prerequisite: Bioc 221–22. (Spring)

270 **Biochemistry and Cell Biology of the Immune Response** (2) Goldstein and Staff
Biochemical aspects of the immune response at the molecular and cellular level. Modern experimental approaches to immunology and cell biology. Prerequisite: Bioc 221–22 and Micr 229, or permission of instructor. (Spring)

271 **Current Topics in Immunology** (1 or 2) Goldstein and Staff
Directed readings in the area of biochemical immunology. May be repeated for credit. Enrollment limited to graduate students in the department. Prerequisite: Bioc 270.

280 **Neurochemistry** (2) Moody and Staff
Content includes molecular structure and function of nerve tissue; intra- and interneuronal communication mechanisms; biochemistry of various brain dysfunctions; and other special topics. Prerequisite: Bioc 201 or 221–22. (Fall)

281 **Current Topics in Neurochemistry** (1 or 2) Moody and Staff
Directed readings in neurochemistry. May be repeated for credit. Enrollment limited to graduate students in the department. Prerequisite: Bioc 280.

295 **Research** (arr.) Staff
Participation in a project under investigation in the department or one in a related field suggested by the student and approved by the staff. Content differs each time course is offered; may be repeated for credit. (Fall and spring)

298 **Advanced Reading** (1 to 6) Staff
Limited to master's degree candidates. May be repeated for credit to a maximum of 6 hours.

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

BIOLOGICAL SCIENCES

Professors R.K. Packer, R. Donaldson (*Chair*), J.R. Burns, D.L. Lipscomb, R.E. Knowlton, K.M. Brown
Associate Professors H. Merchant, D.E. Johnson, J.M. Clark, M.W. Allard, L.C. Smith, F.J. Turano, E.F. Wells, G. Hormiga, P.S. Herendeen, R.P. Tollo
Assistant Professors D.W. Morris, P. Hernandez, J.T. Lill, S.A. Church
Adjunct Professors L.R. Parenti, S.H. Weitzman
Professorial Lecturer D. Goldman

Master of Science in the field of biological sciences—Prerequisite: a bachelor's degree with a major in biological sciences or an equivalent degree: The undergraduate program must have included the following courses, or equivalent: Math 31; Phys 1 and 2, or 21 and 22; Stat 91 or 127.

Required: the general requirements stated under Columbian College of Arts and Sciences. The minimum requirement consists of 24 credit hours of approved course work

plus a thesis (equivalent to 6 credits). With the permission of the department, a student may elect a program of study consisting of 36 credit hours of approved course work without a thesis. All students must pass a Master's Comprehensive Exam.

Doctor of Philosophy in the field of biological sciences—Required: the general requirements stated under Columbian College of Arts and Sciences, plus satisfactory completion of a Preliminary Examination and the General Examination in at least three areas of biology. The program of study and fields of study are determined in consultation with an advisory committee appointed for each candidate.

Major Research Areas: cell, molecular, and developmental biology; systematics and evolution; ecology.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

204 **Seminar: Invertebrate Zoology** (3) Knowlton
Review of selected topics in physiology, development, and ecology of invertebrate animals, including reports on original publications. May be repeated for credit. Prerequisite: BiSc 130 or equivalent. (Fall, even years)

207 **Seminar: Current Topics in Systematic Biology** (1 or 2) Allard, Clark, Hormiga, Lipscomb
Prerequisite: BiSc 210. (Fall and spring)

208 **Bioenergetics** (3 or 4) Merchant
Study of energy fixation and transfer in ecosystems and of their role in behavior, evolution, population dynamics, and species interactions. Students enrolling for 4 credits will devote one additional class meeting per week to an investigation of the nature and methods of science. Prerequisite: BiSc 154 or permission of the instructor. (Fall, odd years)

209 **Seminar: Principles and Mechanisms of Organic Evolution** (3) Lipscomb
Current problems and issues in evolution; speciation, macroevolution, biogeography, and topics of special interest to participants. Prerequisite: BiSc 150 or equivalent. (Spring)

210 **Phylogenetic Systematics** (4) Allard, Hormiga
A rigorous and up-to-date treatment of the theory and methods of systematics, including phylogenetic inference and its applications in evolutionary biology. Laboratory fee, $40. Prerequisite: BiSc 150 or equivalent. (Fall)

211 **Biogeography and Coevolution** (3) Herendeen
Survey of methods and techniques used in biogeography. Geological and paleontological aspects of biogeography; large-scale biogeographic patterns; coevolution. Prerequisite: BiSc 151 or 152 or permission of the instructor. (Fall, odd years)

213 **Descriptive Systematics: Documenting Biodiversity** (3) Hormiga
Study of those aspects of systematic biology concerned with description and inventory of biodiversity. Prerequisite: BiSc 210. (Fall, odd years)

214 **The Phylogenetic Basis of Comparative Biology** (3) Hormiga
The use of phylogenetic hypotheses to study questions in evolutionary biology and ecology. Prerequisite: BiSc 210; Stat 127 or equivalent. (Fall, even years)

215 **Vertebrate Phylogeny** (4) Clark
Lecture (3 hours), laboratory and field (2 hours). A survey of vertebrate diversity, emphasizing evolutionary relationships and adaptations of the major groups. Prerequisite: BiSc 150 or equivalent; BiSc 132 recommended. (Spring, odd years)

216 **Morphological Systematics** (4) Clark
Lecture (3 hours) and laboratory (2 hours). Methods of studying organismal morphology as a means of inferring phylogeny, emphasizing the concept of homology. Laboratory includes techniques of observing, measuring, and imaging morphology in systematic biology, including morphometric methods. Laboratory fee, $40. Prerequisite: BiSc 210 or equivalent. (Spring)

218 **Innate Immunity** (3) Smith
Defense functions in higher plants and immune mechanisms in sponges through lower vertebrates, with comparisons to immune responses in mammals. Prerequisite: BiSc 102; recommended: BiSc 112. (Spring)

221 **Variation and Evolution in Plants** (3) Wells
Biosystematics of plants, covering the literature, concepts, and methodology of breeding systems, cytogenetics, speciation, and conservation. Prerequisite: BiSc 107 or 140 or 150. (Spring, even years)

222 **Diversity and History of Plants** (4) Herendeen
Lecture (3 hours), laboratory (3 hours). A detailed investigation of the diversity, phylogeny, morphology, and fossil history of plants for advanced undergraduates and graduate students. Prerequisite: BiSc 140 or 150 or 151 or equivalent. (Fall, even years)

223 **Angiosperm Diversity and Phylogeny** (4) Herendeen
Lecture (2 hours) and laboratory (2 hours scheduled, 2 hours independent). A detailed investigation of the diversity and phylogeny of flowering plants. Lectures focus on morphological, anatomical, and molecular evidence for relationships within angiosperms. Laboratories focus on structural characteristics of families and higher groups. (Fall, odd years)

225 **Molecular Phylogenetics** (4) Allard
Lecture (3 hours), computer laboratory (2 hours). Review of molecular phylogenetic methods including data recovery, alignment, weighting, character optimization, and phylogenetic inference methods. Laboratory fee, $40. Prerequisite: BiSc 107, 150 and 210 or equivalent. (Spring)

227 **Seminar: Genetics** (3) Johnson
Review of selected topics in genetics, with emphasis on current literature; topics of special interest to participants encouraged. May be repeated for credit. Prerequisite: BiSc 107 or equivalent. (Fall, odd years)

228 **Population Genetics** (3) Johnson
Origin, maintenance, and possible significance of genetic variation in populations. Selection, genetic drift, microevolution of species, and speciation are emphasized. Both theoretical and applied aspects of population genetics are discussed. Prerequisite: BiSc 107 or equivalent. (Fall, even years)

229 **Cytogenetics** (3) Staff
Behavior of chromosomes in mitosis and meiosis as a basis for the transmission of genes from one generation to the next through reproduction and the influence of cytogenetic processes on the mechanisms of evolution. Prerequisite: BiSc 102 or 103 and 107 or equivalent. (Fall)

230 **Human Genetics** (3) Staff
Genetic mechanisms of transmission and expression of human traits, with emphasis on biochemical and cytogenetic aspects. Prerequisite: BiSc 107 or equivalent; previous course work in cell biology or cell biochemistry strongly recommended. (Spring)

242 **Advanced Plant Ecology** (3) Wells
Study of selected topics in adaptive plant strategies and North American plant communities, concentrating on invasive alien plant species. May be repeated for credit. Prerequisite: BiSc 155 or 158. (Spring, odd years)

243 **Seminar: Ecology** (3) Merchant
In-depth study of selected topics, including reports on original publications. May be repeated for credit. Prerequisite: BiSc 154 or equivalent. (Spring, even years)

249 **Seminar: Developmental Biology** (3) Brown, Hernandez
Discussion and reports on recent research on the endocrinological, genetic, and biochemical aspects of animal development. Prerequisite: a course in developmental biology or cell biology. (Spring)

250 **Signal Transduction** (3) Turano
Advanced topics of intra- and intercellular signaling; model signal transduction pathways. Prerequisite: BiSc 103 or Bioc 101 or Chem 163. (Spring)

252 **Seminar: Neurobiology** (3) Staff
Study of current publications in functional neurobiology. May be repeated for credit with instructor's permission. (Spring, odd years)

274 **Gene Regulation and Genetic Engineering** (3) Morris
The control of gene expression as illustrated by several prokaryotic and eukaryotic model systems: discussions of recombinant DNA techniques. Prerequisite: BiSc 107. (Spring)

275 **Introduction to Recombinant DNA Techniques** (3) Staff
Lecture, 1 hour; laboratory, 4 hours. Basic techniques of genetic manipulation: cloning of genes, transformation of bacteria, PCR procedures, DNA sequencing, and other techniques. Prerequisite: BiSc 102 or 107 or 137 or equivalent and permission of instructor. Laboratory fee, $40. (Fall, even years)

295 **Research** (arr.) Staff
Investigation of special problems. May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

BIOMEDICAL SCIENCES

Committee on Biomedical Sciences
L. Werling (*Director*), V. Chiappinelli, R.P. Donaldson, V. Gallo, K. Kennedy, S. Ladisch, D. Leitenberg, W. Nierman, D. Perry, J. Vanderhoek

The interdisciplinary doctoral programs in the biomedical sciences are organized within the Institute for Biomedical Sciences. The first full year of study toward the Ph.D. programs in the fields of biochemistry, genetics, immunology, molecular and cellular oncology, neuroscience, and pharmacology is offered through the Institute. Faculty are drawn from GW's Columbian College of Arts and Sciences and School of Medicine and Health Sciences, including scientists from the Children's Research Institute of Children's National Medical Center and the Institute for Genomic Research.

The biomedical sciences core curriculum consists of BmSc 210, 211, 212, 213, 214, and 216–18; 3 credit hours of BmSc 215; and (if required) BiSc 122, Human Physiology.

Students are admitted directly into the Institute for Biomedical Sciences through Columbian College of Arts and Sciences. At the end of the first year of study, each student selects one of the six Ph.D. fields and completes remaining degree requirements in the appropriate program. See Biochemistry and Molecular Biology, Genetics, Immunology, Molecular and Cellular Oncology, Neuroscience, and Pharmacology.

210 **Macromolecular Interactions: Proteins** (2 or 4)
Proteins structure and function, introduction to metabolic processes. Registration with permission of instructor.

211 **Macromolecular Interactions: Nucleic Acids and Information Processing** (2 or 4)
Structure and function of nucleic acids, organization of the genome, and regulation of protein synthesis and processing. Registration with permission of instructor.

212 **Cell Biology** (2 or 4)
Structure and functions of cells and tissues, techniques used for the analysis of cell function (image analysis, microscopy). Registration with permission of instructor.

213 **Molecular Medicine I** (4)
The molecular bases of stem cell biology and tissue repair, the immune system, pathogenesis, oncology, and cardiovascular disease. Registration with permission of instructor.

214 **Molecular Medicine II** (2)
The molecular bases of cell signaling, pharmacology, toxicology, and neurological disease. Registration with permission of instructor.

215 **Lab Rotations** (1)
For Ph.D. students enrolled in the Institute for Biomedical Sciences. Laboratory training in advanced techniques in biomedical sciences research practices. May be repeated for credit.

216–18 **Career Skills for the Biomedical Sciences** (1–1–1)
Scientific writing, presentation skills, and seminar planning. Developing roles in the field: research in varying settings, policy and program planning, grants administration, and the biotechnology issues within intellectual property law.

Ethical issues related to the conduct of research, animal use, and human subject participation. The design of a successful grant proposal.

BIOSTATISTICS

Columbian College of Arts and Sciences offers the degrees of Master of Science and Doctor of Philosophy in the field of biostatistics. The School of Public Health and Health Services collaborates with the Department of Statistics and the Biostatistics Center in these degree programs. For the Public Health courses listed below, please contact the School of Public Health and Health Services.

Master of Science in the field of biostatistics—Prerequisite: course work in multivariate calculus, matrix theory, and multiple regression (Math 33 and 124 and Stat 118) and proficiency in computer applications (Stat 130 or 183 or PubH 251). With approval of the academic director, applicants who lack some of the listed prerequisite course work may be admitted to degree candidacy and fulfill deficiencies during the first year of study; such course work does not count toward degree requirements.

Required: The general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 33 hours of course work, including Stat 201–2, 210, 224, 225, and 227; PubH 102, 201, 280, 290, and 291. Two elective courses are chosen from offerings of the Department of Statistics. A two-part Master's Comprehensive Examination is required.

Doctor of Philosophy in the field of biostatistics—Prerequisite: a master's degree in biostatistics or a closely related field, including the prerequisites listed under the Master of Science in the field of biostatistics. In some cases, an exceptionally well-prepared candidate may enter the program with a bachelor's degree.

Required: The general requirements stated under Columbian College of Arts and Sciences, including the required courses for the Master of Science in the field of biostatistics, plus Stat 213, 226, and 263; PubH 231 and one course chosen from PubH 205 or another approved public health course. Electives are chosen from statistics and public health. At the end of the second year of study, a two-part General Examination is taken on probability and statistical inference and on biostatistics and epidemiology. A minimum of 12 hours of dissertation research is required; the dissertation must demonstrate the candidate's ability to do original research that develops methods or applications in the field of biostatistics.

295 **Reading and Research** (arr.)
May be repeated for credit.
299–300 **Thesis Research** (3–3)
398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.
399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

CHEMISTRY

Professors D. Ramaker, M. King (*Chair*), A. Montaser, J.H. Miller, A. Vertes
Associate Professor M.J. Wagner
Assistant Professors C.L. Cahill, M.G. Zysmilich, L.P. Eisen, V. Sadtchenko, H.H. Teng, Z. Xu

Master of Science in the field of chemistry—Prerequisite: a bachelor's degree with a major in chemistry from this University, or an equivalent degree.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work normally includes Chem 207, 213, 221 or 222, 235, and 251. Proficiency in computer programming must be demonstrated. Candidates are required to pass a Master's Comprehensive Examination.

Thesis option—30 credit hours of approved courses are required, including Chem 299–300, Thesis Research, which may be in analytical, inorganic, organic, or physical chemistry.

Nonthesis option—36 credit hours of approved courses are required, including Chem 298. Up to 9 credit hours in other departments related to the student's area of interest (e.g., Forensic Sciences) may be included in the program, subject to the approval of the Depart-

ment of Chemistry. Students who are or will be employed in organizations dealing with science and technology policy programs may select from specified courses offered by Management Science, Political Science, Public Policy and Public Administration, and the Elliott School of International Affairs.

Doctor of Philosophy in the field of chemistry—Required: the general requirements stated under Columbian College of Arts and Sciences. Students develop their program of studies in consultation with their doctoral committee, subject to the approval of the department's Graduate Affairs Committee. The program of studies must include course work in a minimum of five 200-level courses; at least four of the courses must be core courses as defined in the department's Guide to Graduate Studies; at least three must be offered by the Chemistry Department. These course requirements cannot be fulfilled by achievement on placement exams. At least two 200-level courses must be taken outside the subdiscipline of the student and in at least two other subdisciplines/disciplines. Equivalent courses offered by another university may be substituted at the discretion of the Graduate Affairs Committee. Proficiency in computer programming must be demonstrated. The General Examination requirement is replaced by a two-part requirement consisting of a cumulative examination system and a proposal for a research problem.

Research fields: analytical spectroscopy; catalysis; chemical instrumentation; combustion chemistry; environmental chemistry; heterocyclic chemistry; inorganic and organometallics synthesis; inorganic and organic materials; molecular spectroscopy; nanoscale and nanostructured materials; organic synthesis/natural products; polymer chemistry; structure and reactivity studies; surface chemistry; theoretical chemistry; trace analysis; transition metal complexes.

Ph.D. students in chemistry may substitute up to 12 hours of Dissertation Research in the form of course work jointly approved by the Chemistry Department and the Forensic Sciences Department or the International Science and Technology Policy program. The 12 hours may be selected from specified courses offered by Forensic Sciences, Management Science, Political Science, Public Policy and Public Administration, and the Elliott School of International Affairs.

Note: All entering students in graduate chemistry programs are required to take the American Chemical Society Graduate Level Placement Examinations, given by the Department of Chemistry, prior to matriculation. The four placement examinations (in the disciplines of analytical, organic, inorganic, and physical chemistry) are designed to cover the subject matter in the disciplines generally taught in undergraduate programs preparatory for graduate work in chemistry, and the results are used by the department to advise the individual student in planning a program of courses appropriate to the student's background. All graduate students are required to participate in the seminar and colloquium programs. Upon consultation with course instructors, specific course prerequisites may be waived.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

207 **Chemical Bonding** (3) Ramaker
Quantum mechanics, approximate methods, electron spin, Pauli principle, atomic and molecular structure. Prerequisite: Chem 112. (Fall)

211–12 **Physical Chemistry** (1 to 3 each) Ramaker, Wagner, Miller
Same as Chem 111–12. Admission only by departmental permission. Credit assigned upon satisfactory completion of Chem 213. (Academic year)

213 **Chemical Thermodynamics** (3) Miller, Sadtchenko
Application of thermodynamics to chemical problems. Emphasis on statistical calculation of thermodynamic properties. Prerequisite: Chem 112 or 212. (Spring)

218 **Molecular Spectroscopy** (3) Staff
Applications of quantum mechanics and group theory to the interpretation of electronic, vibrational, rotational, and magnetic resonance spectroscopy. Prerequisite: Chem 207. (Spring, odd years)

220 **Selected Topics in Analytical Chemistry** (1 to 3) Staff
Advanced topics offered in a modular format to allow an in-depth examination of a self-selected field of analytical chemistry. One to three topics may be chosen for a given semester. May be repeated for credit.

221 **Spectrochemical Analysis** (3) Montaser
Theory and application of recent spectrometric methods of analysis, including advances in optimization techniques, optical instrumentation, atomic spectrometry, laser-based analytical techniques, X-ray methods, and surface analysis techniques. Prerequisite: Chem 122. (Fall)

222 **Ions: Wet and Dry** (3) Vertes
Principles, instrumentation, methods, and applications of mass spectrometry and electrochemistry; selected state-of-the-art methods demonstrate basic principles to show how new methods of analysis are developed; typical applications highlight solutions of industrial, environmental, biomedical, and forensic problems. Prerequisite: Chem 122. (Spring, even years)

230 **Selected Topics in Inorganic Chemistry** (1 to 3) Staff
Advanced topics offered in a modular format to allow an in-depth examination of a self-selected field of inorganic chemistry. One to three topics may be chosen for a given semester. May be repeated for credit.

235–36 **Advanced Inorganic Chemistry** (3–3) Cahill
Application of modern chemical theories to inorganic substances and reactions; detailed study, developed from the periodic table, of the chemistry of the more common elements; electronic spectra and reaction mechanisms of complexes; organometallic chemistry; homogeneous and heterogeneous catalysis; bioinorganic chemistry. Prerequisite: Chem 112, 152. (Chem 235: spring; Chem 236: fall)

238 **Inorganic Materials Chemistry** (3) Wagner
Synthesis, structure, and properties of materials such as ceramics, superconductors, ionic conductors, nanomaterials, and magnetic, optical, and electronic materials. Emphasis on traditional and low-temperature routes. Prerequisite: Chem 111–12. (Fall, even years)

240 **Selected Topics in Physical Chemistry** (1 to 3) Staff
Advanced topics offered in a modular format to allow an in-depth examination of a self-selected field of physical chemistry. One to three topics may be chosen for a given semester. May be repeated for credit.

250 **Selected Topics in Organic Chemistry** (1 to 3) Staff
Advanced topics offered in a modular format to allow an in-depth examination of a self-selected field in organic chemistry. One to three topics may be chosen for a given semester. May be repeated for credit.

251–52 **Advanced Organic Chemistry** (3–3) Staff
Synthesis, reactions, and properties of organic compounds; fundamental theories of organic chemistry, emphasis on reaction mechanisms. Prerequisite to Chem 251: Chem 112, 152. Prerequisite to Chem 252: Chem 251. (Academic year)

257 **Physical–Organic Chemistry** (3) Staff
The transition state theory of chemical kinetics, applications to reaction mechanisms; kinetic isotope effects, linear-free energy relationships, concentrated and "super" acids, Woodward–Hoffman rules, free radical reactions. Prerequisite: Chem 251 or permission of instructor. (Spring, odd years)

258 **Synthesis and Structure Determination in Organic Chemistry** (3) Staff
The design of syntheses for complex organic molecules; survey of modern synthetic methods, including asymmetric induction; spectroscopic methods of structure determination. Prerequisite: Chem 251 or permission of instructor. (Fall, even years)

259 **Polymer Chemistry** (3) Xu
A study of the preparation, properties, and structure of macromolecules. Prerequisite: Chem 152 and 110 or 111 or permission of instructor. (Fall, odd years)

260 **Selected Topics** (1 to 3) Staff
Advanced topics offered in a modular format to allow an in-depth examination of a self-selected field in chemistry. One to three topics may be chosen for a given semester. May be repeated for credit.

295 **Research** (arr.) Staff
Research on problems approved by the staff. Open to qualified students with advanced training. May be repeated for credit. (Fall and spring)

298 **Independent Study** (3) Staff
Limited to master's degree candidates. A survey of a topic approved by departmental staff and resulting in a written report, and the presentation of a seminar.

299–300 **Thesis Research** (3–3) Staff

395 **Independent Research** (arr.) Staff
Dissertation research for students in Unit I of the Doctor of Philosophy Program. May be repeated for credit.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy cumulative examinations. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

CIVIL AND ENVIRONMENTAL ENGINEERING

Professors K. Mahmood, M.I. Haque, K.H. Digges (*Research*), A. Eskandarian, K. Roddis (*Chair*)
Associate Professors V. Motevalli, R. Riffat, M.T. Manzari
Assistant Professors C.D. Kan (*Research*), S.S. Badie
Adjunct Professors B. Whang, M.O. Critchfield, C. Smith
Professorial Lecturer G.C. Everstine

See the School of Engineering and Applied Science for programs leading to the master's, professional, and doctoral degrees.

201 **Numerical Methods in Engineering** (3) Eskandarian and Staff
Eigenvalue problems. Numerical solution of systems of equations and ordinary differential equations. Solution techniques for elliptic, parabolic, and hyperbolic partial differential equations. Numerical methods for solving finite element equations. Introduction to solution of fluid-flow problems. Prerequisite: CE 117 or approval of department. (Fall)

202 **Application of Probability Methods in Civil Engineering** (3) Staff
Uncertainty in real-world information; basic probability concepts and models; random variables; useful probability distributions, statistical estimation of distribution parameters from observed data; empirical determination of distribution models; testing hypothesis; regression and correlation analyses; decision theory. Prerequisite: ApSc 115 or equivalent. (Fall, even years)

205 **Advanced Strength of Materials** (3) Manzari and Staff
Deflection of beams using singular functions, unsymmetrical bending of beams, beams on elastic foundation. Beam-column problems, shear center for thin-walled beam cross sections, curved beams. Applications of energy methods, torsion, basic equations for theory of elasticity, thin- and thick-walled cylinders, stress concentration, and failure criteria. Prerequisite: CE 120. (Spring)

206 **Design of Reinforced Concrete Structures** (3) Badie
Structural behavior of reinforced concrete structures, ultimate strength and deformation characteristics; design of structural components including beams, columns, floor slabs, box-type girders; introduction to prestressed concrete; special topics. Prerequisite: CE 192 or equivalent. (Fall)

207 **Prestressed Concrete Structures** (3) Badie
Structural behavior and failure modes of prestressed concrete structures; design in prestressed concrete, including long-span structures, bridges, and precast systems. Prerequisite: CE 192 or equivalent. (Spring)

208 **Advanced Reinforced Concrete Structures** (3) Badie
Conception, analysis, and design of low-rise and high-rise buildings by ultimate-strength methods, precast systems, progressive collapse, earthquake considerations, domes, folded plates, shell-type structures, and special topics. Prerequisite: CE 202 or equivalent. (As arranged)

209 **Bridge Design** (3) Badie
Application of basic design procedures for reinforced and prestressed concrete bridges, according to AASHTO bridge specifications. Various types of concrete bridges, design superstructure bridge elements (deck slab, girders, bearing pads), and development of superstructure/substructure details. (Fall, odd years)

210 **Methods of Structural Analysis** (3) Badie
Modern methods of analysis of statically indeterminate structures, matrix analysis based on flexibility, stiffness, energy and variational methods, substructuring techniques; consideration of plastic collapse of structures; introduction to the finite element method. Prerequisite: graduate status. (Fall)

211 **Design of Metal Structures** (3) Badie and Staff
Structural behavior of metal structures, conception and design of advanced structural components and systems, hysteretic behavior, plastic design principles, box-type girders, cable systems, composite girders, and special topics. Prerequisite: CE 191 or equivalent. (Spring)

212 **Advanced Metal Structures** (3) Badie and Staff
Conception, analysis, and design of low-rise and high-rise buildings by elastic and inelastic methods, suspended roofs, earthquake considerations, and unique structural systems. Prerequisite: CE 201 or equivalent. (As arranged)

213 **Reliability Analysis of Engineering Structures** (3) Haque and Staff
Probability theory, theory of structural reliability, probabilistic analysis of strength and loads, risk and reliability function, empirical distribution, probability plot. The design service life, method of perturbation, Monte Carlo simulation. Fatigue and fracture, proof testing, inspection and repair–replacement maintenance. Prerequisite: approval of department. (Fall, odd years)

214 **Analysis of Plates and Shells** (3) Haque and Staff
Bending and stretching of thin elastic plates under loading with various boundary conditions, continuous plates and plates on elastic foundations, theory of folded-plate structures. Theory of curved surfaces; general linear bending theory and its simplification to membrane theory; bending stresses in shells of revolution, shallow-shell theory. (Spring, odd years)

215 **Theory of Structural Stability** (3) Haque, Manzari
General criteria for stability, buckling of elastic and inelastic columns and frames, torsional and lateral buckling, variational methods. Buckling of plates and shells under static loads, stability of stiffened structures, effect of imperfections and boundary conditions. (Fall)

216 **Structural Dynamics** (3) Manzari and Staff
Vibration of continuous systems: membranes, beam plates, and shells; approximate methods of vibration analysis; methods of integral transform; analysis of nonlinear systems; wave propagation. Prerequisite: approval of department. (Fall, odd years)

217 **Random Vibration of Structures** (3) Staff
Introduction to random processes, responses of linear structures to stationary and nonstationary random inputs. Structural responses to earthquakes, waves, boundary-layer turbulences, wind loads, etc. Failure analysis of structures under random loads. Prerequisite: approval of department. (Spring, even years)

218 **Structural Design to Resist Natural Hazards** (3) Manzari and Staff
Prediction of forces due to earthquakes and strong winds; generalized codes; pseudostatic methods for preliminary design; codes based on spectra, energy absorption and ductility; influence of foundations; ground failures; static and aeroelastic effects of strong winds. Design project. Prerequisite: approval of department. (Fall, even years)

220 **Continuum Mechanics** (3) Manzari and Staff
Introduction to the mechanics of continuous media. Tensor calculus; kinematics; stress and stress rate, conservation of mass, conservation of linear and angular momentum, energy balance, second law of thermodynamics; constitutive theory; linear and nonlinear elasticity, newtonian fluids, micropolar elasticity. (Fall, even years)

221 **Theory of Elasticity** (3) Manzari, Lee
Introduction to Cartesian tensors; deformation, stress, constitutive relations for linear elasticity; formulation of boundary value problems, variational principles, torsion and bending of prismatial rods, plane problems. Same as MAE 207. Prerequisite: approval of department. (Spring)

222 **Plasticity** (3) Manzari and Staff
Introduction to the continuum theory of plastic deformation. Physical basis of rate-independent plasticity. Concepts of yield, strain hardening and softening, reverse yield, and cyclic plasticity. Constitutive equations describing plastic deformation. Prerequisite: CE 205 or 220. (Spring, odd years)

223 **Mechanics of Composite Materials** (3) Manzari and Staff
Stress–strain relationship for orthotropic materials, invariant properties of an orthotropic lamina, biaxial strength theory for an orthotropic lamina. Mechanics of materials approach to stiffness, elasticity approach to stiffness. Classical

lamination theory, strength of laminates. Statistical theory of fatigue damage. Same as MAE 233. Prerequisite: approval of department. (Spring, odd years)

225 **Introduction to Biomechanics** (3) Staff
Fundamentals of continuum mechanics as they apply to biological materials: concepts of stress, strain, and equilibrium; elastic and viscoelastic properties of solids; physiological fluid mechanics and bioheat and mass transfer. Fundamentals of solid mechanics of soft tissues and bone structures. Development of computer models and applications. Prerequisite: CE 120. (Spring)

226 **Advanced Biomechanics** (3) Staff
Historical overview of biomechanics and biomaterials. Fundamental concepts in mechanics as applied to the treatment of biological systems. Approaches to the mechanical analysis of the human structure under physiological and non-physiological loading conditions. Constitutive laws for biological materials. Finite element applications. Prerequisite: CE 220 or 225. (As arranged)

227 **Introduction to Finite Element Analysis** (3) Haque
Calculus of variations. Variational formulation of the finite element method. Weighted residual techniques. Computer implementation of the finite element method. Application to problems in heat transfer, stress analysis, fluid flow, and structural analysis. Prerequisite: approval of department. (Fall)

228 **Advanced Finite Element Analysis** (3) Manzari, Lee
Review of variational formulation of the finite element method. Formulation of various continuum and structural elements. Application to static and dynamic problems in elasticity, plasticity, large deflection, and instability in plates and shells. Recent developments in finite element methods. Same as MAE 288. Prerequisite: CE 220, 227; or MAE 210, 286. (Spring, odd years)

230 **Fundamentals of Soil Behavior** (3) Manzari and Staff
Soil mineralogy, clay–water–electrolyte systems, soil composition, fabric, structure, volume change behavior, permeability, coupled phenomena, in-situ evaluation of soil behavior. Prerequisite: CE 168 or equivalent. (Fall, even years)

231 **Theoretical Soil Mechanics** (3) Manzari and Staff
Porous media, stress–strain behavior of soil skeleton, elastic and elastoplastic models for soil behavior, critical state concept, cam clay, strength of soils, stress–dilatancy, stress paths. (Fall, odd years)

232 **Geotechnical Engineering** (3) Manzari and Staff
Principles of soil mechanics applied to the analysis and design of mat foundations, pile foundations, retaining structures including sheeting and bracing systems, and waterfront structures. Foundations on difficult soils and reinforced earth structures. Prerequisite: CE 168 or equivalent. (Spring)

233 **Geotechnical Earthquake Engineering** (3) Manzari and Staff
Ground motion, wave propagation, foundation isolation, site response analysis, seismic stability of retaining structures, soil structure interaction. Prerequisite: graduate standing. (As arranged)

234 **Rock Engineering** (3) Manzari and Staff
Classification and properties of rock; nature of rock masses and rock discontinuities; field exploration; methods of excavation; design and applications to foundation slopes, tunnels, and chambers in rock. Prerequisite: approval of department. (As arranged)

240 **Environmental Chemistry** (3) Riffat and Staff
Principles of chemistry of natural waters, water supplies, wastewaters, hazardous wastes. Stoichiometry, equilibrium, solubility, kinetics, organic chemistry, biochemistry, analytical techniques. Examples from water/wastewater practice to illustrate applications. (Fall)

241 **Advanced Sanitary Engineering Design** (3) Riffat and Staff
Elements of design including basic parameters and hydraulic requirements. Layout and design of water supply and wastewater systems, pumping stations, and treatment plants. Plant expansions and modifications. Prerequisite: CE 197 or equivalent. (Spring)

242 **Principles of Environmental Engineering** (3) Riffat and Staff
Basic concepts of water, air, and terrestrial environments and interrelationships among them. Principles of environmental chemistry and microbiology. Assessment of environmental quality and impacts. Environment and health. Water and wastewater systems. Legal and regulatory controls. (Fall)

243 **Water and Wastewater Treatment Processes** (3) Riffat and Staff
Theory and application of commonly used processes. Sedimentation, coagulation, filtration, disinfection, gas transfer, activated sludge, trickling filters, oxidation ponds, sorption, and sludge stabilization and disposal. Process combinations to produce treatment systems. Prerequisite: CE 242. (Spring)

244 **Environmental Impact Assessment** (3) Riffat and Staff
Public policy and legislation on environmental quality. Methods for assessing impacts of engineering projects. Technology for assessing impacts on air, water, and land environments, applied to transportation facilities, water and wastewater facilities, industrial and community development. (Fall)

245 **Microbiology for Environmental Engineers** (3) Riffat and Staff
Principles of microbiology and applications to lakes, streams, hazardous wastes, and biological treatment systems. Methods for evaluating impacts of wastewaters and hazardous wastes on ecological systems. Concepts of limnology, including limiting of nutrients and control of nuisance growths. (Spring, even years)

246 **Advanced Treatment Processes** (3) Riffat and Staff
Principles and applications of advanced treatment systems for water, wastewater, and hazardous wastes, including: biological nutrient removal, oxidation-reduction processes, stripping, sorption, membrane processes, chemical precipitation, others. Prerequisite: CE 243. (Fall, even years)

247 **Industrial Waste Treatment** (3) Riffat and Staff
Types of industries, waste sources. Characteristics, measurements, and evaluation. Minimization and reuse. Treatment process selection, development, and design. Regulations, permits, standards, monitoring, and pretreatment. Prerequisite: CE 240 or approval of department. (Fall)

248 **Introduction to Hazardous Wastes** (3) Riffat and Staff
Regulations, including RCRA and Superfund. Transport and fate of hazardous substances. Elements of environmental toxicology, risk assessment, and hazard ranking. Monitoring, data collection, and evaluation. Waste minimization. Case histories. Prerequisite: approval of department. (Spring)

250 **Open Channel Flow** (3) Mahmood and Staff
Types and regimes of flow; energy and momentum principles, uniform flow, gradually varied flow, spatially and rapidly varied flow. Flow in nonprismatic channels. Unsteady flow; dam break problem, flood routing. Prerequisite: CE 193 or equivalent. (Fall)

251 **Hydraulic Engineering** (3) Haque and Staff
Hydraulic design of conveyance, regulating, and measurement structures. Design for spillways, energy dissipators, inlet and outlet works related to dams. Forces on hydraulic structure and stability analysis. Hydraulic turbines and pumps. Design considerations for flow through pipes. Transients and cavitation. Prerequisite: CE 193 or approval of department. (As arranged)

252 **Design of Dams** (3) Mahmood and Staff
Project planning and investigations. Types of dams; design of earth–rock fill dams; stability analysis, foundation treatment, wind–wave protection. Construction methods for dams. Reservoir sedimentation. Safety inspection of dams. Prerequisite: CE 193 or graduate status. (Spring, even years)

253 **Advanced Hydrology** (3) Mahmood and Staff
Precipitation, evaporation, and transpiration. Soil physics; stream flow, drainage basins, hydrograph analysis, and stream-flow routing. Design criteria, flood frequency statistics and analysis, flood forecasting and control, water-supply forecasting. Prerequisite: CE 195 or equivalent. (Spring, even years)

254 **Groundwater and Seepage** (3) Haque and Staff
Permeability theory of groundwater flow, flow nets, analogs, computer solutions; applications to engineering problems such as excavation dewatering, flow through dams, stabilization of earth slopes. Prerequisite: approval of department. (Spring)

255 **Mechanics of Water Waves** (3) Haque
Irrotational theory for deep- and shallow-water waves, reflexion, refraction, diffraction, attenuation. Water waves of finite amplitude: shallow-water theory, tides, bores, long-waves theory, conoidal and solitary waves. Wave generation

by wind. Wave breaking and reflexion. Prerequisite: ApSc 213 and permission of instructor. (As arranged)

256 **Water Resources Planning and Control** (3) Mahmood and Staff
The parameters of water resources planning and control, economics of water resources and related natural resources, economics of water-quality control, physical parameters of water resource development, water resources law. Prerequisite: approval of department. (Fall, even years)

257 **Hydraulic Modeling** (3) Mahmood and Staff
Dimensional analysis and similitude. Types of models—physical, mathematical. Distortions in physical models. Erodible bed models. Prerequisite: CE 193. (Fall, even years)

258 **Numerical Methods in Environmental and Water Resources** (3) Mahmood and Staff
Use of microcomputers in water resources. Elements of finite difference schemes, basic operations, convergence, stability, and consistency. Nonuniform flow and error analysis; unsteady laminar flow; diffusion problems; unsteady flow in open channels; water hammer, seepage flow, and diffusion–dispersion problems. Prerequisite: approval of department. (Spring)

259 **Pollution Transport System** (3) Mahmood and Staff
Distribution of pollutants in natural waters and atmosphere, diffusive and advective transport, mathematics for stream pollutant deoxygenation rates, groundwater pollution transport, sediment transport, thermal transport, numerical simulation of pollutant transports in streams and estuaries. Prerequisite: CE 193, MAE 131. (Fall, even years)

260 **Analytical Mechanics** (3) Eskandarian and Staff
Fundamental principles, particle and rigid-body dynamics, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations. Prerequisite: approval of department. (Fall)

261 **Vehicle Dynamics** (3) Eskandarian and Staff
Engineering principles and analytical methods explaining the performance of an automotive vehicle. Basic mechanics governing vehicle dynamic performance in longitudinal, ride, and handling modes. Engineering analysis techniques applied to basic systems and subsystems to derive the governing equations. Prerequisite or corequisite: CE 260. (Spring, even years)

262 **Vehicle Standards and Crash Test Analysis** (3) Digges and Staff
Safety mandates and comparison of motor vehicles based on U.S. and European safety standards. Characteristics of dummies and mechanical devices specified for crash testing. U.S. national accident and injury data; calculation of benefits of safety measures. (Fall)

263 **Crash Investigation and Analysis** (3) Digges and Staff
Crash reconstruction methods for systematic investigation of vehicle crashes. Analysis of vehicle safety systems and their effectiveness; computer simulation and analysis of crash data; sensitivity of analytical techniques; case investigations. (Spring)

264 **Nonlinear Finite Element Modeling and Simulation** (3) Eskandarian and Staff
Rigid and flexible body methods for modeling crashes. Application of dynamic nonlinear finite element methods with contact algorithms for modeling crash phenomena. Modeling and simulation of vehicles, airbags, safety restraining systems, and highway barriers. (Fall)

269 **Pavement and Runway Design** (3) Manzari and Staff
Pavement types, wheel-load characteristics; stresses in pavements and subgrades; empirical methods of design of flexible and rigid highway and airfield pavements; general principles of runway design. Prerequisite: graduate standing or department approval. (Spring, odd years)

270 **Systems Dynamics Modeling and Control** (3) Eskandarian and Staff
Introduction of concepts in control theory and applications to solve problems in civil and transportation engineering dealing with single-input/single-output and multi-input/multi-output systems. Review of classical control theory in the frequency and time domain, state–space analysis, system optimization, and non-linear control. (Fall)

272 **Traffic Engineering and Highway Safety** (3) Eskandarian and Staff
Roadway traffic capacity and network performance measures; steady and unsteady traffic flow phenomena; traffic control signalization theory and practical implementation; monitoring techniques, instruments, and data processing for highway safety. Traffic related highway safety design concepts. Prerequisite: graduate standing or approval of department. (Fall)

273 **Intelligent Transportation Systems** (3) Eskandarian
Commands, controls and communications in modern multimodal transportation; infrastructure/highway and vehicle automation, advanced traffic management, vehicle control and safety systems; information, data, and sensory requirements; practical applications and projects. Prerequisite: graduate standing or approval of department. (Spring)

290 **Special Topics** (1 to 6) Staff
Topic to be announced in the *Schedule of Classes.*

298 **Research** (arr.) Staff
Basic research projects, as arranged. May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

320 **Theory of Elasticity II** (3) Lee, Manzari
Application of integral transform and analytic function theory to solution of plane problems; elastic wave propagation. Three-dimensional elasto-statics. Prerequisite: ApSc 211; CE 232. (Fall, odd years)

321 **Nonlinear Mechanics of Continua** (3) Lee, Manzari
Polar decomposition, invariance, isotropy, representation theorems for invariants and isotropic tensor functions. Deformation, kinematics, stress, balance principles. Principles for constitutive relations. Applications to nonlinear elasticity and non-Newtonian fluids. Prerequisite: approval of department. (Spring, even years)

350 **Sedimentation Engineering** (3) Mahmood and Staff
Problems of erosion and sedimentation. Properties of sediment. Initiation of motion. Suspension of sediment and sediment discharge theories. Sedimentation measurements. Economic and legal aspects. Prerequisite: CE 250 or approval of department. (Fall, odd years)

351 **Mechanics of Alluvial Channels** (3) Mahmood and Staff
Physical processes in drainage basins and channels. Channel forms and bed forms. Hydraulics and sediment transport in alluvial channels. Design of stable channels. Qualitative and quantitative response of rivers. Channel stabilization, navigation channels. Case studies including environmental impacts. Prerequisite: CE 250 or approval of department. (Fall, even years)

352 **Advanced Hydraulics** (3) Mahmood
Theory of unsteady flow. Diffusion and dispersion through pipes and open channels. Numerical solutions using finite element and finite difference methods. Prerequisite: CE 250 or approval of department. (Spring, even years)

370 **Intelligent Systems Theory and Applications** (3) Eskandarian
Overview of artificial intelligence, neural networks, genetic algorithms, fuzzy systems, and hybrid intelligent systems and their integration with other information processing methods. Intelligent systems applications; examples are drawn from ITS and traffic engineering, vehicle safety, remote sensing, and structural design optimization. Prerequisite: CE 201, 270. (As arranged)

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

COMPUTER SCIENCE

Professors W.D. Maurer, S.Y. Berkovich, M.B. Feldman, P.S. Bock, J.L. Sibert, R.S. Heller, C.D. Martin (*Chair*), H.-A. Choi, A. Youssef, B. Narahari, S. Muftic (*Research*), J.K. Hahn, N. Howard (*Research*)
Associate Professors S. Rotenstreich, R. Simha, T. Rosenberg (*Research*), A. Bellaachia
Assistant Professors R.W. Lindeman, J. Stanton, X. Cheng, P. Vora, L.D. Florea
Adjunct Professors G.J. Kowalski, D.C. Roberts, S.H. Kaisler

Associate Professorial Lecturers T. Hanson, T. Aleem, A. Draganova, M. Happel, A. Kim, R. Sabett
Assistant Professorial Lecturers R.A. Fernandez, T. Bragg, M. Lancaster

See the School of Engineering and Applied Science for programs leading to the master's, professional, and doctoral degrees. A certificate program in computer security and information assurance is offered by the Department of Computer Science.

207 **Scientific Databases** (3) Berkovich and Staff
Database management systems and information retrieval systems. Requirements of scientific databases; advanced data modeling techniques to capture the semantics of scientific applications. Data repositories and advanced retrieval capabilities. Database query languages and query optimization. Database web connectivity. Prerequisite: CSci 123 and either CSci 103 or 133. (Spring)

210 **Advanced Software Paradigms** (3) Feldman and Staff
Object-oriented, procedural, functional, and concurrent software design paradigms; design patterns; software life-cycle concepts. Tradeoffs between compiled and interpreted languages. Examples from Ada, Java, C, C++, and Perl. Prerequisite: CSci 123, 133. (Fall and spring)

211 **Computer Architectures** (3) Narahari and Staff
Concepts in processor, system, and network architectures; architecture of pipeline, superscalar, and VLIW/EPIC processors; multiprocessors and interconnection networks. Cache coherence and memory subsystem design for multiprocessor architectures. Parallel and distributed system architecture; internetworking. Prerequisite: CSci 123, 133, 135. (Fall and spring)

212 **Design and Analysis of Algorithms** (3) Youssef and Staff
Design and analysis of algorithms. Turing machines; NP-Complete theory. Algorithmic techniques: divide-and-conquer, greedy, dynamic programming, graph traversal, backtracking, and branch-and-bound. Applications include sorting and searching, graph algorithms, and optimization. Prerequisite: CSci 123, 133. (Fall and spring)

220 **Theory of Computation** (3) Narahari and Staff
Theoretical foundations of computer science. Formal languages and automata; regular expressions, context-free languages, parsing; Turing machines and complexity; partial recursive functions; undecidability; program correctness; fixed-point theory; formal specifications of software. Prerequisite: CSci 210, 212. (Spring)

221 **Advanced Data Structures** (3) Berkovich and Staff
Sparse matrix transpose and multiplication. List insertion and deletion, lists of available space. In-order, preorder, and postorder traversal of trees. Topological sorting. Binary search trees, including AVL trees, B-trees, and tries. Dynamic hashing. Prerequisite: CSci 212. (Spring)

223 **Graph Theory and Applications** (3) Choi and Staff
Undirected and directed graphs. Connectivity, partitions, cycles and matchings. Edge and vertex coloring, chromatic polynomials, and the four-coloring problem. Planar graphs and Kuratowski's theorem. Properties of random graphs. Applications to a variety of problems. Prerequisite: CSci 212. (Spring, even years)

225 **Data Compression** (3) Youssef and Staff
Background on signals, information theory, transforms, human vision, and metrics. Lossless and lossy compression techniques. Video compression. Compression standards. Progressive transmission. Prerequisite: CSci 212. (Fall)

227 **Numerical Solutions of Algebraic Systems** (3) Berkovich and Staff
Numerical solutions of linear algebraic equations and the algebraic eigenvalue problem. Sparse matrix techniques. Solutions of nonlinear simultaneous equations. Interpolation and extrapolation. Prerequisite: CSci 212. (Fall, even years)

232 **Computer Networks** (3) Simha and Staff
Fundamental concepts in the design and implementation of computer communication networks and internet, their protocols, and applications. Layered network architectures, applications, network programming interfaces, transport, routing, data link protocols, local area networks, network management, and network security. Prerequisite: CSci 211. (Fall)

233 **Internet Protocols** (3) Stanton and Staff
Understanding of the layered protocols for the Internet. Interconnection of networks. The IP protocol and routing algorithms, switches, bridges, and routers. The transmission control protocol (TCP). Addressing and names. Application-specific protocols, FTP, TELNET, SMTP, SNMP, HTTP. Domain name services. Prerequisite: CSci 210, 232. (Fall)

234 **Design of Internet Protocols** (3) Stanton and Staff
Protocol specifications and formal description methods. Finite-state descriptions of Internet protocols. Specification and Description Language. Implementation of protocol specifications. Prerequisite: CSci 212, 233.

235 **Distributed and Cluster Computing** (3) Stanton and Staff
Overview of network programming. Interconnection networks and system architecture for clusters. Cluster design, benchmarking, management, and configuration. Distributed computing on the web and grids. Distributed naming, location, authentication, and high availability. Programming high-performance clusters. Prerequisite: CSci 211. (Fall, odd years)

238 **Computer System Performance** (3) Narahari and Staff
Queuing models of computer systems and applications of queuing theory to computer modeling. Bounds on system performance. Mean-value analysis of computer systems. Modeling specific subsystems. Queuing models for analysis. Limitations of queuing models. Analysis of transaction processors and terminal-oriented systems. Prerequisite: CSci 211. (Fall, odd years)

239 **Comparative Computer Systems** (3) Youssef and Staff
Structures of computers and a system description language. History, characteristics, and philosophies of different computer structures. Special-purpose processors, multiprocessors, networks, and time-shared systems. Comparison of computer families. Performance evaluation. Effects of software and technology on computer structures. Prerequisite: CSci 211. (Spring, odd years)

241 **Database Management Systems** (3) Narahari and Staff
Design and architecture of relational database management systems; query languages, data models, index structures, database application design. Prerequisite: CSci 210, 211, or equivalent. (Fall)

242 **Database Systems** (3) Narahari and Staff
Concepts in database systems. Relational database design. Editing, report generation, updating, schema refinement, tuning. Construction of database management systems. Conceptual and logical design of a database. Prerequisite: CSci 241. (Spring)

244 **Information Retrieval Systems** (3) Berkovich and Staff
Information organization and retrieval of natural language data by digital computer systems; statistical, syntactic, and logical analysis of natural language; dictionary and thesaurus systems; searching strategies and cataloging. Large-scale file structures. Prerequisite: CSci 210, 211. (Spring)

246 **Compiler Optimization** (3) Narahari and Staff
Overview of compilers, parsing techniques, code generation. Compiler optimization techniques, including register allocation, instruction scheduling. Compiler design for ILP processors. Prerequisite: CSci 210, 211, 212. (Fall, even years)

251 **Distributed Operating Systems** (3) Rotenstreich and Staff
Architecture, concurrent processes, interprocess communication, distributed scheduling, distributed shared memory, distributed security, synchronization and elections, distributed agreement, transactions and replicated data. Prerequisite: CSci 210, 211, 212. (Fall)

252 **Component-Based Enterprise Software Development** (3) Rotenstreich and Staff
Component-based software development for enterprise applications. Component models, multi-tier architecture. Specific case studies may include topics such as Enterprise Java Beans, DCOM, and COBRA. Prerequisite: CSci 210. (Fall)

253 **Object-Oriented Design** (3) Rotenstreich and Staff
Object-oriented systems, software reusability, software modularity, top–down and bottom–up approaches, object classification, genericity, metaprogramming, concurrent object-oriented programming languages. Prerequisite: CSci 210. (Spring)

254 **Software Engineering** (3) Rotenstreich and Staff
The life-cycle model. Requirements and specifications. Design models, structured and object-oriented design. Program development, PDL's tools, configuration control. Program, unit, and integration testing. Program verification.

Other development models. Development metrics. Computer-aided software engineering (CASE). Prerequisite: CSci 210, 212. (Spring)

255 **Software Engineering Development** (3) Rotenstreich and Staff
Formal methods in software engineering. First-order logic, basic specification elements, rigorous proofs, formal development process, concurrency. Prerequisite: CSci 211, 212. (Fall)

256 **Software Testing and Quality** (3) Rotenstreich and Staff
Flow graphs and path testing, transaction flow testing, data flow testing, software metrics, system testing, test planning and documentation, reliability, statistical testing. Prerequisite: CSci 254. (Fall)

259 **Advanced Object-Oriented Programming** (3) Maurer and Staff
The design patterns of Gamma, Helm, Johnson, and Vlissides. The C++ Standard Template Library (STL), a generic programming paradigm that has been adapted to the C++ programming language, and is an extensible framework for generic and interoperable components. Prerequisite: CSci 210 or familiarity with C++, data structures, and object-oriented programming. (Spring)

260 **Design of Interactive Multimedia** (3) Heller and Staff
History, theory, and development of multimedia concepts. Hardware components, platforms, and authoring tools. Scientific, technical, and cognitive foundations of various media including text, sound, graphics, and video. Interface design. Use of a media taxonomy as a design and evaluation tool. Completion of a multimedia portfolio required. Prerequisite: CSci 210. (Fall)

261 **Design and Implementation of Educational Software** (3) Martin and Staff
History and types of computer-based learning (CBL). Models of learning theory and instructional design. Scripted and generative design strategies, use of authoring systems. Intelligent tutoring systems. Dissemination, legal issues. Overview of research issues in CBL. Project required. Prerequisite: CSci 260. (Spring)

262 **Computer Graphics Programming Tools** (3) Hahn and Staff
Standard graphics and animation programming tools and packages. Lab-specific software tools for sound, motion control, and rendering. Hardware used for video recording and editing. Peripheral devices such as stereo glasses, head-mounted displays, and trackers. Prerequisite: CSci 185, 211. (Spring)

263 **Computer Graphics II** (3) Hahn and Staff
Curves and surfaces. Spatial sampling and aliasing. Visible surface algorithms. Illumination and shading models, raytracing and radiosity. Image manipulation and texture mapping. Procedural models. Prerequisite: CSci 185. (Spring)

264 **Design of Human–Computer Interface** (3) Sibert and Staff
Design of dialogues for interactive systems. Psychological, physiological, linguistic, and perceptual factors. Advantages and disadvantages of various interaction techniques, command language syntaxes, and data presentations. Design methodology and guidelines. Case studies, research readings, and projects. Prerequisite: CSci 210. (Spring)

266 **Computer Animation** (3) Hahn and Staff
Euler angles and quaternions; articulated figure motion; forward and inverse kinematics; kinematic, physically based, and behavioral motion control; rendering problems (temporal aliasing); sound synthesis and synchronization; recording and editing techniques. Prerequisite: CSci 185 or permission of instructor. (Fall)

270 **Artificial Intelligence** (3) Bock and Staff
Representation and space search. Heuristic search. Predicate calculus. Knowledge representation and knowledge engineering for expert systems. Rule-based, hybrid, and O-O systems. Semantic nets, frames, and natural language. Theorem provers. Overview of planning, learning, neural nets. Use of AI languages. Prerequisite: CSci 174, 212. (Fall)

271 **Adaptive Learning Systems I** (3) Bock and Staff
Learning as an alternative to rule-based schemes for artificial intelligence. Deterministic and probabilistic simulation of games. Markovian and bounded-context systems. The algedonic process. Introduction to collective learning systems theory. Design, simulation, and evaluation of collective learning automata. Prerequisite: CSci 174, 212. (Fall)

278 **Models of Cognition** (3) Bock and Staff
The central nervous system as a natural precedent for AI: structure and function of the neuron and neural networks; sensors and actuators; modular brain func-

tion. The cognitive process. Intelligence metrics. Genetics and self-organizing systems. Memory mechanisms. The psychological basis of learning and behavior. Prerequisite: CSci 174, 212. (Spring, odd years)

283 **Computer Security Principles** (3) Vora and Staff
Risk analysis and risk management. Introduction to cryptography; encapsulation and advanced cryptographic standards; ISO/OSI Security mechanisms and services; secure operating systems and models of security; common criteria; authentication mechanisms; security effects of programming languages; database security and statistical inference controls. Prerequisite: CSci 210.

284 **Computer Cryptography Principles** (3) Vora and Staff
Review of mathematical theory for cryptography. Classical ciphers. Modern block and stream ciphers. Symmetric and asymmetric systems. Public key infrastructure. Key management issues. Elliptical curve implementations. Prerequisite: CSci 212.

286 **Network Security Principles** (3) Stanton and Staff
Security in local, global, and wireless networks; packet-level communication security protocols; intrusion detection systems and firewalls; network authentication protocols; secure network applications: secure E-mail and web operations; secure mobile agents. Prerequisite: CSci 283.

297 **Special Topics** (1 to 3) Staff
Topics to be announced in the *Schedule of Classes*. (Fall and spring)

298 **Research** (arr.) Staff
Applied research and experimentation projects, as arranged. May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

301 **Research and Evaluation Methods** (3) Bock and Staff
Required for all computer science doctoral candidates. The scientific method; research/design requirements and objectives: qualitative, quantitative, and case studies; performance metrics; design procedures and control; sources of error and bias; evaluation tools; formal validation methods; documentation standards. Prerequisite: ApSc 115. (Fall)

325 **Advanced Computing Algorithms** (3) Choi and Staff
Graph algorithms, strongly connected components, biconnected components, dominators in acyclic graphs, ordered trees, network flow, planarity testing, bipartite matching, theory of NP completeness, NP-complete problems. Design and analysis of approximation algorithms for NP-complete problems. Prerequisite: CSci 212. (Spring, odd years)

326 **Parallel Algorithms** (3) Youssef and Staff
Design and analysis of parallel algorithms. Topics include shared- and distributed-memory parallel computation models, graph algorithms, divide-and-conquer algorithms, numerical problems, parallel algorithms for combinatorial optimization methods. Prerequisite: CSci 211, 212. (Spring, even years)

332 **Advanced Topics in Computer Networks and Networked Computing** (3) Simha and Staff
Seminar on current research and developments in computer networks, Internet, networked computing, mobile computing and pervasive computing. May be repeated for credit. Prerequisites: CSci 211, 212, 233. (Fall, odd years)

338 **Advanced Topics in Distributed Systems** (3) Choi and Staff
Seminar on current research and developments in networks and distributed systems. May be repeated for credit. Prerequisite: CSci 234. (Fall, odd years)

339 **Advanced Topics in Computer Architecture** (3) Narahari and Staff
Seminar on current research and developments in computer architecture. May be repeated for credit. Prerequisite: CSci 235. (Spring, even years)

342 **Advanced Topics in Programming Systems** (3) Feldman and Staff
Seminar on current research and developments in computer programming languages, systems and paradigms. May be repeated for credit. Prerequisite: CSci 210. (Spring, odd years)

343 **Advanced Topics in Information Systems** (3) Berkovich and Staff
Seminar on current research and developments in computer database systems and information retrieval. May be repeated for credit. Prerequisite: CSci 242 or 244. (Fall, odd years)

351 **Advanced Topics in Operating Systems** (3) Rotenstreich and Staff
Seminar on current research and developments in computer operating systems. May be repeated for credit. Prerequisite: CSci 251. (Spring, even years)

355 **Advanced Topics in Software Engineering** (3) Rotenstreich and Staff
Seminar on current research and developments in software engineering. Students develop a software package with the aid of available software tools such as requirement tool, design tool, code generators, testing tools, measurement tools, cost estimation tools. Prerequisite: CSci 255, 256. (Fall, even years)

361 **Advanced Topics in Interactive Multimedia** (3) Heller and Staff
Seminar on current research and developments in interactive multimedia. Team projects encompassing system design, system production, productivity tools, project management, cost analysis, prototyping, testing, and evaluation. Prerequisite: CSci 260. (Spring, even years)

362 **Advanced Topics in Human–Computer Interaction** (3) Sibert and Staff
Seminar on current research and developments in human–computer interaction. May be repeated for credit. Prerequisite: CSci 264. (Fall, odd years)

367 **Advanced Topics in Computer Graphics** (3) Hahn and Staff
Seminar on current research and developments in computer graphics. Spatial and temporal anti-aliasing: hidden-surface algorithms: illumination models, radiosity, textural mapping. May be repeated for credit. Prerequisite: CSci 263. (Fall, even years)

368 **Advanced Topics in Animation and Virtual Reality** (3) Hahn and Staff
Seminar on current research and developments in computer animation and virtual reality. May be repeated for credit. Prerequisite: CSci 266. (Spring, odd years)

371 **Adaptive Learning Systems II** (3) Bock and Staff
Alternative memory structures. Selection and modification policies. Environmental models and evaluation policies. Metrics for performance evaluation of collective learning systems automata. Self-organizing, hierarchical networks of collective learning cells. Prerequisite: CSci 271. (Spring, odd years)

372 **Natural Language Understanding** (3) Bock and Staff
The state of the art of natural language parsing and semantic understanding by computer systems. Review of formal, context-free, and transformational grammars and parsing. Augmented transition networks: problems of complexity, semantics, and context. Deterministic parsing and semantic parsing. Prerequisite: CSci 270. (Fall, odd years)

377 **Advanced Topics in Machine Intelligence and Cognition** (3) Bock and Staff
Seminar on current research and developments in machine intelligence and cognitive science. May be repeated for credit. Prerequisite: Permission of the instructor. (Fall, even years)

381 **Advanced Cryptography** (3) Vora and Staff
Linear and differential cryptanalysis. Cryptanalysis of AES. Factorization and primality. Computational and information-theoretic secrecy. Theory of secrecy. Zero-knowledge proofs. Secret sharing. Cooperative distributed cryptography. Provable security. Prerequisite: CSci 284. (Fall)

384 **Computer Network Defense** (3) Stanton and Staff
Offensive and defensive information warfare operations. Simulation of various attacks on and defenses of computer systems. Laws related to information warfare. History and literature related to information warfare attacks. Prerequisite: CSci 286.

385 **E-commerce Security** (3) Muftic and Staff
Advanced technical topics in e-commerce security. X.500 registration systems, X.509/PKIX certification systems, secure payment methods, smart cards, authorization models in open distributed environments. Secure web systems, technologies, and applications. Prerequisite: CSci 286. (Fall)

386 **Java Security Mechanisms** (3) Muftic and Staff
Theoretical overview and practical aspects of Java security solutions. Students develop individual Java security modules and integrate them into a complete Java security system. Prerequisite: CSci 383. (Spring)

387 **Advanced Topics in Information Assurance** (3) Vora and Staff
Seminar on current research and developments in information assurance. May be repeated for credit. Prerequisite: CSci 283. (Spring, even years)

388 **Wireless and Mobile Security** (3) Simha and Staff
Mobile Agents, Wireless Web, WAP, WEP, Peer-to-Peer Computing; secure routing; intrusion detection and authentication on wireless networks; security for

handheld devices; encryption and cryptographic measures for wireless; real-time wireless security; security measures for embedded devices. Prerequisite: CSci 232, 383.

390 **Colloquium** (0) Staff
Lectures by outstanding authorities in computer science. Topics to be announced each semester. (Fall and spring)

398 **Computer Science Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

COUNSELING/HUMAN AND ORGANIZATIONAL STUDIES

Professors D. Linkowski, J.C. Heddesheimer, D.W. Dew, C.H. Hoare, M. Sashkin, D.R. Schwandt, M. Marquardt, S.A. Marotta (*Chair*)
Associate Professors N.E. Chalofsky, J. Garcia, R.B. Morgan, C.D. Erickson, R. Lanthier
Assistant Professors P.L. Schwallie-Giddis, A.J. Casey, M.S. Wesner, K.C. Hergenrather, M. Cseh, R.M. Dedmond, M.C. McGuire-Kuletz (*Research*)
Associate Professorial Lecturers J.A. Merz, R.J. Pasi
Assistant Clinical Professor M.M. Megivern
Assistant Professorial Lecturers V.A. Sardi, B.J. Peters, C.C. Lorente, C.V. Croswell, Jr., S.K. Peters
Lecturer P. Tschudi

See the Graduate School of Education and Human Development for programs of study leading to the degrees of Master of Arts in Education and Human Development, Education Specialist, and Doctor of Education.

COUNSELING

220 **Special Workshop** (arr.) Staff
Topics to be announced in the *Schedule of Classes*. May be repeated for credit.

251 **Professional and Ethical Orientation to Counseling** (3) Garcia, Dedmond
The roles and functions of a professional counselor and the ethical standards that govern the profession.

253 **Counseling Interview Skills** (3) Hergenrather, Heddesheimer, Erickson
Acquisition of counseling skills common to all theories through lectures, demonstrations by faculty, role playing, and videotaping. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others. Material fee, $25.

254 **Psychosocial Adjustment** (3) Hoare, Linkowski, and Staff
Mental health problems; emphasis on needs of counselors, teachers, and others working with children and adolescents.

255 **Career Counseling** (3) Erickson, Schwallie-Giddis, Dedmond
A consideration of theory, practice, and the body of information related to career counseling, choice, and development over the life span. Prerequisite: Cnsl 253, 259 (for counseling majors); permission of instructor is required for others. Material fee, $25.

257 **Individual Assessment in Counseling** (3) Marotta, Linkowski, Hergenrather
Detailed study of individual analysis and appraisal techniques. Development of systematic case study. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); Psyc 131 or Educ 212 or permission of instructor is required for others. Material fee, $75.

259 **Theories and Techniques of Counseling** (3) Schwallie-Giddis
An introduction to basic counseling and psychotherapeutic theories and associated techniques. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

261 **Group Counseling** (3) Erickson, Linkowski, and Staff
Principles or group dynamics as related to interaction within groups. Techniques and practice in group counseling. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

263 **Social and Cultural Dimensions of Counseling** (3) Garcia
Basic sociocultural concepts in counseling theory and how they apply to the practice of the counseling profession. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

264 **Values, Spiritual, and Religious Issues in Counseling** (3) Staff
The theoretical and practical intersection of counseling, psychotherapy, and mental health considerations with religion and spirituality. The clinically effective and ethically responsible integration of religion and spirituality into counseling. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

266 **Foundations of School Counseling K–12/Practicum** (3) Heddesheimer, Schwallie-Giddis, Dedmond
Study of the environmental and specialty elements for school counseling, with special attention to the principles and practices of school counseling. Includes 100 hours of supervised practicum in a school setting.

267 **Foundations of Employee Assistance Programs** (3) Staff
History, legislation, and foundations of practice of counseling in employee assistance programs. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

268 **Foundations of Community Counseling/Practicum** (3) Erickson, Marotta
Description of community counseling settings, problems clients present, and a consideration of appropriate intervention strategies. Includes 100 hours of supervised practicum in a community counseling program.

269 **Substance Abuse Counseling** (3) Hergenrather and Staff
Individual, group, family, and self-help counseling applied to substance abusers. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

271 **Family Counseling** (3) Marotta
The family as a system: how it affects the client and how the client affects it. Didactic presentations, role playing, and work with simulated families. Prerequisite or concurrent registration: Cnsl 251 or 276 (for counseling majors); permission of instructor is required for others.

272 **Human Sexuality for Counselors** (3) Hoare, Marotta
The purpose of this course is to increase the awareness and understanding of sexuality as it relates to counseling in contemporary society. Prerequisite or concurrent registration: Cnsl 251 or 276 (for counseling majors); permission of instructor is required for others.

274 **Counseling Older Persons** (3) Linkowski
Special considerations and counseling emphases in regard to the life transitions and role changes that occur for older persons. Prerequisite or concurrent registration: Cnsl 251 (for counseling majors); permission of instructor is required for others.

275 **Living and Dying: A Counseling Perspective** (3) Staff
Survey of fundamental psychosocial issues surrounding grief, loss, and life-threatening illness. Topics include AIDS, suicide, multiple loss, caregiver's grief, spirituality, and cross-cultural issues.

276 **Foundations of Rehabilitation and Case Management/Practicum** (3) Hergenrather
Survey of history, philosophy, basic principles, legislation, roles, and services. Includes 100 hours of supervised practicum in a rehabilitation counseling program.

278 **Disability Management and Psychosocial Rehabilitation** (3) Hergenrather, Linkowski, and Staff
Disability management services; psychosocial aspects of disability; rehabilitation services for persons with psychiatric disabilities.

280 **Job Placement and Supported Employment** (3) Linkowski
Job development and modification: placement of persons with disabilities.

281 **Medical and Psychosocial Aspects of Disabilities** (3) Garcia, Linkowski, Hergenrather
Chronic and traumatic disorders with rehabilitation and psychosocial implications.

285 **Internship in Counseling I** (3) Staff
Part of a two-semester clinical experience for degree candidates in counseling. Material fee, $50.

286 **Internship in Counseling II** (3 to 6) Staff
Part of a two-semester clinical experience for degree candidates in counseling. Material fee, $50. Prerequisite: Cnsl 285.

293–94 **Research and Independent Study** (1 to 3) Staff
Individual research under guidance of a staff member. Program and conferences arranged with an instructor.

298–99 **Thesis Research** (3–3) Staff

344 **Advanced Group Counseling** (3) Erickson, Linkowski, and Staff
A post-master's course on interpersonal process groups, with didactic, experiential, and supervisory components. Prerequisite: Cnsl 261 or equivalent; permission of instructor is required.

352 **Organization and Administration of Counseling Services** (3) Linkowski, Marotta
Theory and practice of consultation and administration, with focus on school, community, and rehabilitation settings. Research issues. Admission by permission of instructor.

353 **Work, Identity, and Adult Development** (3) Hoare
Same as HDev/HRD 353.

357 **Doctoral Practicum in Counseling** (2) Marotta, Erickson
Experiential learning of advanced counseling and counseling-related competencies through direct, supervised participation in group work, research, teaching, and/or consultation. Admission by permission of instructor.

358 **Advanced Theories of Counseling** (3) Garcia, Erickson
Current research on counseling and psychotherapy process and outcome; critical analysis of theory with applications for practice and research. For Ed.S. and Ed.D. degree candidates in the field of counseling. Admission by permission of instructor.

359–60 **Doctoral Internship in Counseling and Counselor Supervision** (2–2) Marotta, Erickson

361 **Seminar: Counseling** (arr.) Staff

390 **Predissertation Seminar** (3 to 6) Staff

391 **Dissertation Research** (3 or 6) Staff
Prerequisite: Cnsl/Educ 390.

HUMAN DEVELOPMENT

208 **Lifespan Human Development** (3) Hoare, Lanthier
Continuity and change in developmental attributes. The developing person in relation to social norms, roles, and stage-graded expectations from birth to death. Interaction between biogenetics and environment.

209 **Child Development** (3) Lanthier and Staff
Normal development and the familial and social antecedents of developmental risk. Environments that foster competent children and developmental sequelae of childhood vulnerability and trauma. Adulthood consequences of child abuse and neglect.

210 **Stress, Risk, and Resilience in Adolescent Development** (3) Lanthier and Staff
Key attributes and problems in adolescent development. Normal adolescent development and contemporary social problems in relation to stress, risk, and resilience. For graduate students in counseling, psychology, and related areas.

229 **Cultural Effects on Child, Adolescent, and Adult Development** (3) Lanthier and Staff
Effects of culture on the experience and expression of self, others, space, time, faith systems, norms, and other attributes. Egocentric and sociocentric effects, primitive and technological effects. Group immersion as the basis for prejudice. Developmental consequences as a consequence of cultural context.

261 **Practicum in Human Development** (3) Hoare and Staff
Admission by permission of instructor.

262 **Internship in Human Development** (3) Hoare and Staff
Admission by permission of instructor.

281 **Adult Learning** (3) Hoare
Same as HRD 281.

341 **Emotional and Cognitive Development** (3) Hoare, Lanthier
The development and maintenance of emotional competence, cognitive development, self-esteem, social cognition, and interpersonal skills. Relationships between intellectual reasoning and insight.

344 **Adult Development and Aging** (3) Hoare
Theories and research on personality and intelligence in adulthood and old age. Research designs and methods. Implications of developmental data for counseling and selected professional roles.

353 **Work, Identity, and Adult Development** (3) Hoare
The influence of work on identity, intellectual and personality development, and other developmental attributes. Same as Cnsl/HRD 353.

356 **Issues and Special Topics in Human Development** (3 to 6) Hoare, Lanthier
Issues and special contemporary topics related to child, adolescent, and adult development. Applications for professional roles.

HUMAN RESOURCE DEVELOPMENT

220 **Special Workshop** (arr.) Staff
Topics to be announced in the *Schedule of Classes*. May be repeated for credit.

234 **Action Learning** (3) Marquardt
Processes, principles, and skills necessary to participate in and lead both single- and multiple-problem action learning sets. The six dimensions of action learning; educational psychological, political, sociological, and management theories underlying action learning.

236 **Technology and Human Resource Development** (3) Staff
How technology can best be utilized in the HRD environment. Discussion of CBT, use of the Internet for instruction, and distance learning techniques.

239 **International and Multicultural Human Resource Development** (3) Cseh, Marquardt
The impact of culture and globalization on U.S. and international HRD programs and practices. Adult learning and organizational change approaches that develop and utilize the synergy of workforce diversity. Successful international HRD programs.

263 **Foundations of Human Resource Development** (3) Cseh, Wesner, and Staff
How individuals and groups learn and interact within organizations and how organizations function and learn. Motivation, group dynamics, systems theory, organizational culture, and change.

264 **Design of Adult Learning in Human Resource Development** (3) Marquardt
Designing and implementing training programs. Topics include instructional design techniques, designing effective programs, program planning and marketing techniques, and conducting needs assessments and evaluations of training programs.

269 **Organization Diagnosis for HRD** (3) Cseh, Wesner, Chalofsky
The assessment of organizational conditions, including collection and interpretation of information, operations, and problems (human, structural, and systemic). Course participants collect and analyze data to provide solutions to enhance organizational effectiveness.

272 **Internship in Adult Learning and Human Resource Development** (3 to 6) Staff
Supervised experience in selected areas of human resource development and adult education. Admission by permission of instructor.

274 **Work Groups and Teams in Organizations** (3) Chalofsky, Wesner, Morgan
Exploration of the nature of work groups and teams as they are utilized in organizational settings. Group and team dynamics, facilitating and leading skills, and group roles and boundaries.

277 **Increasing the Capacity to Learn** (3) Chalofsky
Identification of actions that can help increase the capacity to learn. Transformation of the workplace.

281 **Adult Learning** (3) Cseh, Hoare
Premises and theories used to meet learning needs of adults. Overview of various learning theories and the impact of various stages of adult development on learners. Topics including self-directed learning, accommodating individual learning needs, and creation of effective learning techniques. Same as HDev 281.

282 **Strategies for Adult Learning** (3) Staff
Theoretical and practical components of instructional delivery in various settings, including corporate training environments. Students design and implement teaching strategies, such as concept attainment, group investigation, and creative thinking.

283 **Leadership in Organizations** (3) Sashkin
Developments in theory and research centered on transformational leadership.

284 **Assessing Impact of HRD Efforts** (3) Morgan and Staff
Knowledge and skills needed to evaluate the impact and return on investment of HRD efforts. Focus on how to plan and conduct systematic evaluations of HRD efforts, including the choice, development, and use of various tools for measuring individual, group, and organizational change.

286 **Issues in Human Resource Development Programs** (3) Morgan and Staff
Current issues and topics of importance in the field. Students gather data and analyze key topics associated with areas such as globalization, diversity in the workplace, organizational development, and ethics.

287 **Strategic Human Performance Processes** (3) Morgan, Wesner
Overview of systematic coordination and use of HR management concepts as an integral element of organizational strategy. HRD implications of these tools, with an emphasis on building the HR system.

288 **The Humane Organization** (3) Chalofsky
Characteristics of the humane organization and of meaningful work. Theories of work motivation; social and organizational issues.

289 **Consulting Skills in Human Resource Development** (3) Sashkin, Chalofsky
Introduction to the concepts, methods, and skills required for effective consultation in organizations, as either an internal or an external consultant. Meeting the human needs in organizations, while improving performance and productivity. Students undertake a consulting project in an organization. Prerequisite: HRD 269.

290 **Organizational Learning** (3) Schwandt, Casey
Learning in an organizational context. Processes through which the organization as a system learns, unlearns, changes, and disseminates information. Organizational learning theories address the processes and barriers of gathering, using, developing, and retaining knowledge in organizations.

293–94 **Research and Independent Study** (1 to 3) Staff
For students who have a specific interest in a topic related to HRD. An in-depth project is completed under the guidance of a faculty member. The course is arranged individually with an instructor.

299–300 **Thesis Research** (3–3) Staff

320 **Topics in Human Resource Development Doctoral Studies** (3) Staff
Topics to be announced in the *Schedule of Classes.*

321 **Seminar: Advanced Issues in Human Resource Development** (3) Sashkin, Casey

327 **Seminar: Applied Research in Human Resource Development** (3) Sashkin, Casey

353 **Work, Identity, and Adult Development** (3) Hoare
Same as Cnsl/HDev 353.

363 **Foundations of Human Resource Development** (3) Chalofsky and Staff
Relationships between individuals and their interactions in groups within an organizational context. Overview of theoretical foundations of key areas associated with HRD. Motivation, systems theory, group dynamics, organizational culture, and learning.

369 **Theory and Design of Organizational Diagnosis** (3) Schwandt
Focus on various paradigms through which organizations and their functions may be viewed; a variety of analytical models of organizations; techniques for assessing systems; application of analysis techniques.

374 **Work Groups and Teams in Organizations** (3) Chalofsky, Marquardt
Theoretical understanding and practical considerations of working with groups and teams. Group dynamics, facilitating and leading groups, and member roles. Group facilitation techniques across different group settings and environments.

379 **Practicum in Adult Learning Programs** (3 to 6) Staff
380 **Advanced Organizational Learning** (3) Schwandt, Casey
The psychological and sociological paradigms associated with the learning of a collective whole.
381 **Theory, Research, and Practice in Adult Learning Development** (3) Hoare
Learning theories as applied to adults in individual and group learning transactions; effect of age on learning; psychological, physical, and social environments in adult education situations.
386 **Interdisciplinary Readings in Human Resource Development** (3) Schwandt, Casey, Chalofsky
Seminal works from various disciplines related to current HRD research and practice.
390 **Predissertation Seminar** (3 to 6) Staff
391 **Dissertation Research** (3 or 6) Staff
Prerequisite: HRD/Educ 390.

CRIMINAL JUSTICE

See **Sociology**.

ECONOMICS

Professors J.L. Gastwirth, R.M. Dunn, Jr., R.S. Goldfarb, A.M. Yezer, J.J. Cordes, J. Pelzman, R.P. Trost, B.L. Boulier, H.S. Watson, M.D. Bradley, S.C. Smith, A. Klamer (*Research*), P. Labadie, G.L. Kaminsky, D.O. Parsons (*Chair*), R.F. Phillips, C.M. Snyder, D. Ribar, M.O. Moore, N. Vonortas
Associate Professors A.S. Malik, F.L. Joutz, S.M. Suranovic, S. Joshi, W.P. Mullin
Assistant Professors V. Fon, J. Soares, D.M. Stryk, R.M. Samaniego, M. Cipriani, M.C. Long, C. Wei
Instructor S. Emran
Adjunct Professors J. Hardt, E.H. Solomon, S.N. Kirby
Professorial Lecturers R.S. Belous, D. Fixler, H. Hertzfeld, J. Kilpatrick, H. Stekler, F.D. Weiss
Associate Professorial Lecturer L. Clauser
Assistant Professorial Lecturers S.E. Baldwin, N. Pham, D. Trybula, J. Vega

Master of Arts in the field of economics—Prerequisite: (1) a Bachelor of Arts degree with a major in economics or with course work in economics that includes intermediate microeconomic and macroeconomic theory (equivalent to Econ 101, 102 or 217–18); (2) an understanding of basic calculus, equivalent to Math 31–32. Applications are accepted for the fall semester only.

Required: the general requirements stated under Columbian College of Arts and Sciences and completion of one of the following options.

Option A: 30 credits of course work, including Econ 301, 305, 375, 376, and either 302 or 306; and five additional courses chosen in consultation with the Department's M.A. advisor. (Four of these additional courses come from two clusters—groups of related courses—with two courses from each cluster. An M.A. thesis may be substituted for the two courses in one of these clusters.) Students must earn at least a grade of *B*− in Econ 301, 305, and either 302 or 306.

Option B (primarily for those interested in pursuing a Ph.D.): 30 credits of course work, including Econ 301, 302, 305, 375, 376, and either 303 or 307; three additional courses chosen in consultation with the Department's M.A. advisor. Two of these three additional courses (unless only one is available) should fulfill the requirements of one of the Department's Ph.D. fields (excluding micro and macro theory). Students must earn at least a grade of *B*− in Econ 301, 305, and either 302 or 306.

Doctor of Philosophy in the field of economics—The Ph.D. program involves study in two sequential units. Unit I includes satisfactory completion of required course work, and passing the General Examination. This first unit must be concluded within five years after entry into the program. Upon successful completion of Unit I, students are considered for admission to Unit II, the dissertation stage, which must be completed within five years after entry. In all cases, however, the student is expected to complete the doctorate within eight years after admission.

Students must meet the general requirements stated under Columbian College of Arts and Sciences. For Unit I, the requirements include Econ 301, 302, 303, 305, 306, 307, 375,

and 376, plus 24 additional credits of approved graduate course work and passing the General Examination.

General Examination: The General Examination consists of two preliminary examinations, one in microeconomic theory and one in macroeconomic theory, and two field examinations. Students must take the preliminary examinations within three semesters of entering the program and before any field examinations are taken. Field examinations are given in econometrics, economic development, environmental and natural resource economics, health economics, industrial organization, international economics, labor economics, monetary theory and policy, public finance, and regional and urban economics.

To pass the General Examination, students must earn a grade of "satisfactory pass" or better in the preliminary examinations in microeconomic and macroeconomic theory and in one of the two field examinations and no grade below "bare pass." Two of the examinations, preliminary or field, may be taken a second time with the approval of the Department. No further opportunity to take the examinations is permitted. Substitution of a field examination (in an area not originally chosen by the student) to satisfy the requirements of the General Examination is equivalent to taking a field examination a second time. Students should consult with the professors responsible for their fields and notify the Department two months in advance of their intention to take the examinations. If such notification is not given sufficiently in advance, it may not be possible to sit for the examination.

For Unit II, the requirements include formulation of an acceptable dissertation proposal, completion of a dissertation that demonstrates the candidate's ability to do original research, and 24 credits of additional graduate course work, of which at least 12 credits must be dissertation research. Students, including those who have an accepted dissertation proposal, must enroll in a dissertation proposal seminar (Econ 397) in the first semester after promotion to Unit II. Satisfactory performance in the seminar will be equivalent to 3 credits of Unit II course work. In cases where knowledge outside the discipline of economics is critical to the student's research field, up to 6 credits in Unit II may consist of required courses outside the Economics Department.

Departmental prerequisite: Graduate courses in economics (except 214, 217–18, 219, 220, 221, 222, 249, 250, 280, 283, 284) are designed for graduate students in economics. Graduate students in other disciplines may register for third-group courses after having completed Econ 217–18, or 218 and 219, or 101 and 102, unless the course description indicates that these prerequisites have been waived. Intermediate-level micro and macro courses taken elsewhere usually satisfy this requirement, but introductory or first-year courses do not. In addition to these prerequisites and any others specific to the particular course, calculus is required in some sections of graduate economics courses.

214 **Survey of Mathematical Economics** (3) Fon
For graduate students in fields other than economics. Differentiation, partial differentiation, and economic optimization problems; comparative statics; input–output analysis; difference, differential equations, and economic applications. Prerequisite: one semester of calculus and Econ 217–18.

217–18 **Survey of Economics** (3–3) Goldfarb, Watson, Bradley, Fon, Joutz, Malik, Phillips, Long
Intermediate-level microeconomic theory (Econ 217) and intermediate-level macroeconomic theory (Econ 218) for graduate students in fields other than economics. (Econ 217 and 218—fall and spring)

219 **Managerial Economics** (3) Boulier, Fon, Goldfarb
Intermediate microeconomic theory, with emphasis on production and costs, market structure and pricing, risk analysis, and investment theory and capital budgeting. Credit can be earned for only one of Econ 217, 219, and 220. (Fall and spring)

220 **Managerial Economics for MBAs** (2) Boulier
Intermediate microeconomic theory, with emphasis on production and costs, market structure and pricing, risk analysis, and investment theory and capital budgeting. Credit can be earned for only one of Econ 217, 219, and 220. (Fall and spring)

221 **Economics in Policy Analysis** (3) Cordes, Brock, Long
Same as PPol 204.

222 **Benefit–Cost Analysis** (3) Cordes
The application of microeconomic theory and welfare economics to the empirical evaluation of public policies and programs. Applied welfare economics as a framework for policy analysis; empirical measures of welfare change; tech-

niques of benefit–cost analysis. Prerequisite: Econ 217 or equivalent; recommended: Econ 221.

223–24 **Monetary Theory and Policy** (3–3) Labadie
Theory of monetary policy within the framework of contemporary American central banking. (Academic year)

237 **Economics of the Environment and Natural Resources** (3) Malik
Analysis of public policy problems relating to the environment and natural resources development and management. Prerequisite: Econ 217. (Spring)

239 **Economics of Defense** (3) Staff
Economic analysis applied to national security planning and objectives. Analysis of defense establishment problems, including manpower, the defense industry base, procurement policy. (Spring)

241–42 **Labor Economics** (3–3) Ribar, Parsons
Theory of wages and employment, analysis of labor supply and demand. Analysis of unemployment; unions; wage regulation. (Academic year)

245–46 **Industrial Organization** (3–3) Snyder
Econ 245: Economic theory and evidence regarding industrial market structure, conduct, and economic performance. Econ 246: Economic issues in antitrust and government regulation of the U.S. economy. Econ 245 is prerequisite to Econ 246. (Academic year)

248 **Health Economics** (3) Staff
Demand for medical care; organization of the health care delivery industry; policy issues on regulation, efficiency, and allocation of health care services. (Fall)

249 **Industrial Organization—The Telecommunication Industry** (3) Brock
Principles of industrial organization, welfare economics, and theories of regulation, in theory and in practice. Market power, merger analysis, vertical relationships, entry, and regulation of price and lines of business. The study of market performance and business practices of the telecommunication industry. Prerequisite: Econ 101, 217 or equivalent. Offered off campus only.

250 **Survey of Economic Development** (3) Smith, Emran
An introduction to economic problems faced by less developed countries. Emphasis placed on applications to policy-making and evaluation. Prerequisite: Econ 217 or 280 or equivalent. (Spring)

251 **Development Economics I** (3) Smith, Emran
The application of economic theories, empirical studies, and policy issues to economics problems of developing countries, with an emphasis on microeconomic aspects. Topics include income distribution and poverty, urban migration, peasant and agrarian efficiency, fertility preference, industrial policy, multinational enterprise, and international trade policy. (Fall and spring)

252 **Development Economics II** (3) Smith, Emran
Continuation of Econ 251, with an emphasis on macroeconomic aspects. Topics include new theories of economic growth and general theories of the development process, macroeconomic stabilization, financial repression and deepening, debt and aid policies, and applied economy-wide policy models. (Fall and spring)

255 **Economics of Technological Change** (3) Vonortas
Economics of research and development; innovation and growth; the role of government in the development and use of new technology. (Fall)

257 **Regional Economics** (3) Yezer
Study of regional planning and growth models, including input–output, programming, and econometric models used by planning agencies; analysis of interregional production, trade, migration, firm location, and pricing models. (Fall)

258 **Urban Economics** (3) Yezer
Analysis of spatial relationships among economic activities within an urban area including the urban land, labor, and housing markets; urban transportation models; fiscal relationships among jurisdictions. Prerequisite: Econ 257 or permission of instructor. (Spring)

263 **Public Finance I** (3) Cordes, Watson
Theoretical and empirical analysis of the economic role of the public sector and the effects of public expenditures on resource allocation and income distribu-

tion. Topics include public goods, externalities, social insurance, and benefit-cost analysis. (Fall)

264 **Public Finance II** (3) Cordes, Watson
Theoretical and empirical analysis of the effects of taxes and transfers on the allocation of resources and income distribution. Topics include partial and general equilibrium models of tax incidence, effects of taxes on labor supply, saving, and portfolio choices of households and on investment and financing decisions of firms. (Spring)

269–70 **Economy of China** (3–3) Staff
Econ 269: Analysis of organization, operation, policies, and problems. Development of the economy since 1949. Econ 270: Examination of critical problems of development. Prerequisite to Econ 270: Econ 269 or permission of instructor. (Academic year)

271 **Economy of Japan** (3) Staff
Analysis of Japanese economic institutions and their contribution to Japan's development. (Fall)

277 **Laboratory in Applied Econometrics** (3) Trost, Joutz, Phillips, Ribar
Application of econometric theory and the use of econometric software; students are required to write an empirical research paper. The course usually deals exclusively with either micro or macroeconomic issues. May be repeated for credit provided the topic differs.

278 **Economic Forecasting** (3) Joutz
Introduction to the theoretical and applied aspects of economic forecasting. Topics include the role of forecasting, univariate time-series analysis, single equation models, multiple series models, and evaluation of forecasts. Prerequisite: Econ 275 or equivalent or permission of instructor. (Spring)

280 **Survey of International Economics** (3) Moore, Suranovic
Introductory-level international trade and finance, primarily for Elliott School students. Topics include the economic effects of trade liberalization and protection, exchange rate determination, and macroeconomic policies in an open economy. Prerequisite: Econ 11–12.

281 **International Trade Theory** (3) Moore, Pelzman, Suranovic
International trade theory, including alternative models of the gains from trade and evaluations of the new justifications for protectionism, and analysis of commercial policy, factor flows, and trade and investment with multinational corporations. Prerequisite: most sections require calculus or permission of instructor. (Fall)

282 **International Finance and Open-Economy Macroeconomics** (3) Kaminsky
International finance, including alternative models of balance of payments behavior and adjustment, payments accounting, exchange markets, and alternative exchange-rate regimes. (Spring)

283 **Survey of International Trade Theory and Policy** (3) Dunn, Moore, Pelzman, Suranovic
For graduate students in fields other than economics. Survey of international economics and policy; application of comparative advantage and other arguments for trade; impact of trade on a domestic economy; new arguments for protectionism; regional trading blocs. (Fall and spring)

284 **Survey of International Macroeconomics and Finance Theory and Policy** (3) Dunn, Moore, Pelzman, Suranovic, Kaminsky
For graduate students in fields other than economics. Open-economy macroeconomics; international finance; balance of payments accounting; exchange markets; alternative models of balance of payments determination and adjustment; behavior of flexible exchange rate systems. (Fall and spring)

285–86 **Economic Development of Latin America** (3–3) Staff
Econ 285: Diversity of structures of Latin American economies; import substituting industrialization; inflation; problems of underemployment and income distribution. Econ 286: Structure of trade; protection, exports, and economic development; regional and global economic integration; foreign investment, multinational enterprise, and technology transfer. (Academic year)

290 **Principles of Demography** (3) Boulier
Introduction to basic demographic perspectives and data; methods for analysis of population size, distribution, and composition; determinants and conse-

quences of population trends. Departmental prerequisite waived. Same as Geog/Soc/Stat 290. (Fall)

291 **Methods of Demographic Analysis** (3) Boulier
Basic methods for analysis of mortality, natality, and migration; population estimates and projections; estimation of demographic measures from incomplete data. Departmental prerequisite waived. Same as Geog/Soc/Stat 291. (Spring)

295 **Special Topics** (3) Staff
Topics vary, depending on current issues of interest and faculty availability. (Fall and spring)

298 **Reading and Research** (3)
Limited to master's degree candidates.

299–300 **Thesis Research** (3–3)

301 **Microeconomic Theory I** (3) Joshi, Fon
Theory of unconstrained optimization; optimization subject to equality and inequality constraints, along with applications. Profit maximization, utility maximization and cost minimization, concave and quasi-concave functions, monotone comparative statics, duality theory, the envelope theorem and Le Chatelier principle, and the Kuhn–Tucker conditions. (Fall)

302 **Microeconomic Theory II** (3) Joshi, Fon
Expected utility theory, general equilibrium in a pure exchange economy and economy with production, welfare theorems and the core theory of the competitive firm in the short run and long run, monopoly and price discrimination, models of oligopoly. Prerequisite: Econ 301. (Spring)

303 **Microeconomic Theory III** (3) Joshi, Fon
Theory of games, including Nash equilibrium and its refinements and comparative statics, evolutionary game theory, multistage games and subgame perfection, repeated games and oligopolistic supergames, static and dynamic Bayesian games, auction theory, and bargaining theory. Prerequisite: Econ 302. (Spring)

305 **Macroeconomic Theory I** (3) Bradley, Labadie, Joutz
Alternative theories of income, employment, and the price level; impact of monetary and fiscal policy; role of expectations in the economy; and microfoundations of macroeconomic models and dynamic analysis. (Fall)

306 **Macroeconomic Theory II** (3) Bradley, Labadie, Joutz
Extensions of alternative models of income determination, economic growth, and the application of analytical frameworks to the U.S. and international economies. Prerequisite: Econ 305. (Spring)

307 **Macroeconomic Theory III** (3) Bradley, Labadie, Joutz, Samaniego
Extensions to stochastic and dynamic general equilibrium frameworks, with emphasis on economic policy. Prerequisite: Econ 306. (Fall)

337 **Environmental Economics** (3) Malik
A detailed analysis of the theory of environmental economics and an introduction to the optimal exploitation of renewable and nonrenewable resources. (Fall)

375 **Econometrics I** (3) Phillips, Trost
Statistical foundations for econometrics; standard methods of estimation and inference for classical and generalized regression models. Same as Stat 275. (Fall)

376 **Econometrics II** (3) Phillips, Trost
Topics may include asymptotic theory, statistical endogeneity, instrumental variables estimation, discrete and limited dependent variable models, and time–series models. Prerequisite: Econ 375. Same as Stat 276. (Spring)

377 **Econometrics III** (3) Phillips, Trost
Econometric methods for systems of equations and panel data, with additional topics that may vary from year to year. Prerequisite: Econ 376.

395 **Advanced Special Topics** (3) Staff
Topics vary depending upon current interests and faculty availability. Open to graduate students in economics. May be repeated for credit.

397 **Dissertation Proposal Seminar** (3) Staff
Limited to Doctor of Philosophy candidates in Unit II. Critical analysis of current research. Formulation of a dissertation proposal and development of dissertation research strategies.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

EDUCATIONAL LEADERSHIP

Professors S.R. Paratore, R. Ferrante, G. Confessore, E.B. Howerton, Jr., I.C. Rotberg (*Research*), M.H. Futrell, R.O. Mueller (*Chair*), W.K. Cummings, E. El-Khawas
Associate Professors C.B. Stapp, G.B. Jackson, B.H. Khan, J. Gomez, Y. Nakib, S.A. McDade, R.A. Chernak, R.R. Watkins, M.D. Corry, M. Kim
Assistant Professors J.H. Williams, W.A. Brown, L. Lemasters, N.B. Milman, C.J. Yen, S.A. Dannels, J.H. Lim, V. Roach

See the Graduate School of Education and Human Development for programs of study leading to the degrees of Master of Arts in Education and Human Development, Master of Education, Master of Arts in Teaching, Education Specialist, and Doctor of Education.

Departmental prerequisite: A bachelor's degree from an accredited college or university is prerequisite to all 200-level courses. With permission of the instructor, undergraduates in their senior year may enroll in 200-level courses.

201 **International and Comparative Education** (3) Williams
Theoretical foundations of comparative and international education; systematic investigation of the structure and practices of selected representative school systems in different parts of the world. Emphasis on development of methodologies for comparative study.

202 **Regional Studies in International Education** (3) Cummings, Williams, and Staff
In-depth study of education in a selected region of the world. Structures and issues facing education systems in social, political, economic, cultural, and historical context. Prospects of education for human national development. May be repeated for credit provided the region differs.

203 **Programs and Policies in International Education** (3) Williams and Staff
Overview of policies and programmatic responses to issues in international education. Topics include education and development, international higher education and student services, and education and marginalized people. May be repeated for credit provided the topic differs.

204 **Strategies and Analysis in International Education** (3) Williams, Cummings, and Staff
Strategies for improving policies and programmatic responses to issues in international education. Topics include education and development, international higher education and student services, or education and marginalized people. May be repeated for credit provided the topic differs.

205 **International Experiences** (1 to 6) Williams, Cummings, and Staff
Study and research in a foreign country. Admission by permission of the instructor.

206 **Capstone in International Education** (3) Williams
Review of core topics in international education and completion of major supervised project or paper. Taken near the end of the master's program in lieu of the Comprehensive Examination.

207 **Telecommunications in Education** (3) Staff
Telecommunication technology in education and training contexts. Students gain practical understanding of networks, wave transmission, fiber optics, satellites, and how these systems support various electronic devices. Prerequisite: Educ 180 or equivalent. (Summer)

212 **Quantitative Methods I: Introduction to Measurement and Data Analysis** (3) Staff
First-level course in social science research methods. Overview of basic measurement concepts, educational and psychological testing, and descriptive data analysis (measures of shape, location, and dispersion; correlation). (Fall, spring, and summer)

214 **History of American Education Reform** (3) Jackson and Staff
An examination of how evolving social, economic, and political forces have propelled and opposed American education reform efforts throughout history. (Fall)

220 **Experimental Course** (arr.) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

221 **Internship: International Education** (3) Williams, Cummings
Service in an international education institution or related program designed to enable the student to connect theory to practice. Admission by permission of instructor. (Fall and spring)

222 **Museum Studies** (3) Stapp
An overview of the museum as an environment for learning, considering the influence of institutional history and organizational structure on the museum's mission of serving the public. Admission by permission of instructor. (Summer)

223 **Museum Audiences** (3) Staff
A survey of the museum's diverse audience, emphasizing implications for effective programming, with attention to audience research. Admission by permission of instructor. (Fall)

224 **Communication Skills** (3) Staff
Theory of and practice in the development of communication skills in the museum. Educational concepts; teaching strategies and techniques; institutional liaison and group process. Admission by permission of the instructor. (Summer)

225 **Research in International Education** (3) Cummings, Williams
Critical reading and practice in conducting research in international comparative education. May be repeated for credit.

226 **Internship and Seminar in Museum Education** (6) Stapp
Four-day-a-week placement in education departments in area museums supervised by George Washington University faculty. On-campus seminar includes grant proposal writing. Admission by permission of instructor. (Spring)

227 **Museum Evaluation** (3) Stapp and Staff
Evaluation and research methods appropriate to the museum setting. Review of research on museum audiences; designing program and exhibit evaluations. Admission by permission of instructor. (Spring and summer)

228 **Selected Topics in International Education** (3) Williams, Cummings, and Staff
Current trends, themes, and issues in international education. Admission by permission of instructor.

229 **History of Educational Technology** (3) Staff
The development of educational technology and the changes in social values and educational philosophy that have shaped modern applications. (Fall and spring)

230 **Managing Computer Applications** (3) Ferrante, Patrick
For managers and prospective managers in education and human services who are concerned with the automation of their operations. Basic principles needed to design, implement, and manage an information system. Admission by permission of instructor. (Spring and summer)

231 **Educational Hardware Systems** (3) Milman
Design and implementation of educational hardware systems, including computers and computer networks.

232 **Applying Educational Media and Technology** (3) Corry
Theory and practice of educational technology. Key characteristics of different media, principles of application, and issues concerning their appropriate use.

233 **Supervised Experience in Education and Human Development Services** (3 to 6) Staff
Admission by permission of instructor. (Fall and spring)

234 **Computers in Education and Human Development** (3) Corry
The research and practice surrounding the use of computers in educational and training settings. Students will acquire the practical knowledge necessary to the development and evaluation of computer-related curricula through projects and case studies.

235 **Design and Implementation of Educational Software** (3) Corry
Theory and practice of creating educational software; psychological basis of using software in learning; instructional programs; authoring tools; artificial intelligence applications; interactive media. Students design and evaluate an educational program. Prerequisite: Educ 232 or permission of instructor.

236 **Critical Issues in Distance Education** (3) Staff
Historical, conceptual, theoretical, and practical issues associated with distance education as a foundation for research and practice in the domain of distance education as well as adult learning, educational systems design, and school administration and policy. Prerequisite: Educ 180 or equivalent.

237 **Instructional Needs Analysis** (3) Watkins
An introduction to the role of instructional needs analysis and assessment. The design and development of instruction. Key elements of the instructional design cycle. Prerequisite: Educ 180 or equivalent.

238 **Technology and Disabilities** (3) Staff
Assistive technology as it impacts the lives of people with disabilities, including the performance of tasks related to employment, education, and activities of daily living. Prerequisite: Educ 180 or equivalent.

239 **Learning Technologies and Organizations** (3) Staff
The role of learning technology in organizations, learning in the workplace, and knowledge management in corporations, schools, and universities. Prerequisite: Educ 180 or equivalent.

240 **Proposal Writing** (3) Ferrante
The preparation of proposals for educational, business, and industrial applications, including those submitted for funding. Many styles and formats are illustrated. Each student will prepare a proposal in cooperation with an organization or agency.

242 **Fundamentals of Educational Leadership and the Change Process** (3) Staff
Current leadership theory and systems behavior in the context of administrative practice in educational settings. Key elements of leadership and management. The impact of context, culture, power, politics, change, communications, and organizational learning on administration. (Fall)

243 **Human Relations Diversity** (3) Staff
Application of current theory and research findings in human relations to staff motivation, change, conflict management, and communication techniques for working with individuals and groups within organizations. (Summer)

244 **Managing Multicultural Environments** (3) Staff
Application of multicultural research in identifying key elements for managing diverse school environments, communicating with families, planning professional development activities, and increasing student learning. (Spring)

246 **Administrative Issues in Education** (3) Lemasters
The impact of major social, political, economic, and education issues on the role of school leaders and the delivery and quality of programs and services. (Spring)

248 **Supervision and Evaluation of Instruction** (3) Lemasters
The roles and functions of educational leaders in the areas of curriculum, staff development, instructional supervision, and evaluation of personnel. Theory and practice to increase teacher effectiveness and improve student learning through supervisory strategies. (Fall)

259 **Site-Based Leadership: K–12** (3) Staff
A general introduction to the principalship. Stresses leadership theory, roles, and management tasks in instruction, curriculum, budget, staff development, supervision, interagency services, student learning, and policy considerations. Site-based management and communication within a changing and diverse school environment. (Fall)

260 **Supervision in the Elementary and Secondary School** (3) Howerton, Lemasters
For experienced teachers and administrators. Legal and policy basis for personnel evaluation and supervisory practices. Review of modern supervisory concepts, including practices in schools. Prerequisite: Educ 248. (Spring)

265–66 **Developing World Wide Web Materials for Education I–II** (3–3) Staff
The design, development, integration, and use of World Wide Web resources in education and training concepts. Prerequisite to Educ 265: Educ 180 or equivalent; prerequisite to Educ 266: Educ 265. (Fall and spring)

267 **Master's Practicum in Higher Education Administration** (3 to 6) Ferrante
Supervised practical experience in college student development programs. Admission by permission of instructor. (Fall and spring)

268 **Leadership and Education** (3) El-Khawas, Howerton
A general introduction to issues of leadership applicable to education settings and to key features of educational organization, including schools, school systems, colleges and universities, and advocacy organizations. Leadership as a process and set of skills. The interaction between leadership styles and organizational contexts.

271 **Education Policy** (3) Jackson, Nakib
An introduction to the development, implementation, and assessment of education policies at national, state, and local levels. (Fall and spring)

272 **Educational Planning** (3) Brown
An examination of the planning movement in education: its historical development and the recent shift in premises, context, and expectations. Different approaches to the planning process; its role in research; and overview of main analytical techniques currently in use.

273 **Foundations of College Student Development** (3) Staff
College student development theories, practices, and problems, including historical overview and human development theories related to college students. (Spring)

274 **Group and Organizational Theories** (3) Staff
Review of major organizational theories inside and outside higher education, including systems, institutional, cultural, cognitive, environmental, ecological, as well as power and influence.

275 **School Finance** (3) Staff
The financing of public elementary and secondary education in the United States; current revenue sources, distribution decisions, and trends in the fiscal operations of schools. Litigation, finance policies, and equitable investments of public monies. (Spring)

276 **School–Community Relations** (3) Lemasters
The purpose, scope, essential elements, and impact of a successful school–community relations program. Community power structures, the roles of policy and leadership, communication techniques for interacting with various audiences and the media, evaluation of public relations and marketing for educational institutions. (Fall)

277 **Dynamics of Change** (3) Staff
An analysis of the process of change, particularly as it relates to educational policy. Comparison of theories; analytical tools; historical precedents; examples of federal education policies.

278 **School Law and Policy** (3) Howerton
The legal basis of education and public schools in the United States. Constitutional provisions and federal statutes that guide school law. Legal factors that influence school policy. Consideration of practical school situations for legal implications, development of skills to research legal issues affecting schools, and preventive law measures. (Spring)

279 **Practicum in Supervision** (3 to 6) Staff
Practical experience in supervision of instruction. Admission by permission of instructor. (Fall and spring)

280 **Internship in Supervision and Instructional Leadership** (3 to 6) Staff
Service in a school situation directed by the University's faculty and school systems; integration of theory and practice.

281 **Program Evaluation: Theory and Practice** (3) Jackson
Introduction to the theory of social program evaluation, alternative evaluation models and methodologies, and the political and social contexts of evaluation.

282 **Administration of College Student Development Services and Programs** (3) Staff
An overview of student affairs administrative practices, including needs assessment, planning models, budgeting, policy development, program development, facility management, evaluation, and team building. Admission by permission of instructor. (Fall)

283 **Higher Education in the United States** (3) McDade
History, philosophy, scope, purpose, present status, programs, and trends in higher education in the United States. (Fall)

284 **Administration of Higher Education** (3) Ferrante, Brown
Government, organization, and administration of colleges and universities; duties of trustees and administrators. (Spring)

285 **Education and National Development** (3) Cummings
In terms of the basic assumption that education contributes to national development, the course examines the role education plays in the process of national development in advanced industrial societies and societies moving to industrialism.

286 **Interpretation in the Historic House Museum** (3) Stapp
Same as AmSt 286. Seminar integrating advanced practices of museum education with current scholarship in architectural history, material culture, and social history. Extensive use of Washington museum resources. Admission by permission of instructor. (Fall)

287 **Museums and Technology** (3) Staff
Applications of technology that link the public with the museum: Internet exhibitions, interactive computer programs, video conferencing, the electronic classroom. Guest lectures, field trips, and group projects. Same as MStd 287.

290 **Leadership in Higher Education** (3) McDade
Cognitive leadership theory as articulated in higher education: what leadership is, how it works, how it is practiced, how it is considered by scholars and practitioners, and how it is researched. Case studies. Prerequisite: Educ 283, 284.

291 **Instructional Design** (3) Watkins
Designing, implementing, and evaluating instructional strategies for learners. Assessing needs, writing objectives, selecting curriculum/content, selecting and implementing methods and techniques, selecting appropriate devices and evaluating instruction. Prerequisite: Educ 180 or equivalent.

292 **Practicum in Educational Policy Program Evaluation** (3 to 6) Jackson and Staff
Supervised practical experience in field placements. Admission by permission of instructor. Prerequisite: Educ 281. (Fall, spring, and summer)

293–94 **Research and Independent Study** (1 to 3) Staff
Individual research under guidance of a staff member. Program and conferences arranged with an instructor. (Academic year)

295 **Quantitative Methods II:** Staff
Research Design and Data Analysis (3)
Required of all GSEHD master's students. Social science research methods. Emphasis on research design and descriptive and inferential data analysis. Prerequisite: Educ 212 or equivalent. (Fall, spring, and summer)

296 **Internship in Educational Technology Leadership** (3) Khan
Students are assigned to a cooperating agency and work in consultation under the guidance of the course instructor. Admission by permission of instructor.

297 **Educational Technology Leadership Master's Project** (1–6) Khan
Students design, develop, implement, and evaluate an individual project. Admission by permission of instructor.

299–300 **Thesis Research** (3–3) Staff

301 **Advanced Study: Ideas, Issues, and Practices in Education** (3) Staff
For precandidates for the Ed.D. Alternative means of responding to the complexities of the educational process. Topics vary but concern education as an individual process and as sociocultural preservation and renewal. May be repeated for credit. (Fall and spring)

302 **Quantitative Methods III:** Paratore, Yen, Dannels
Basic Inferential Data Analysis (3)
Required of all GSEHD doctoral students. Topics include one- and two-way ANOVA, correlation, and simple linear regression. Prerequisite: Educ 295 or equivalent. (Fall)

303 **Advanced Quantitative Data Analysis** (3 to 6) Mueller
Multivariate analysis methods such as factor analysis and structural equation modeling. Analyses performed with commonly used statistical software packages. (Fall)

306 **Quantitative Methods IV:** Paratore, Mueller, Yen
Research Design and Analysis (3)
Required of all GSEHD doctoral students. In-depth exploration of sampling strategies, research design selection, instrumentation, and data collection and analysis procedures. Prerequisite: Educ 302 or equivalent. (Spring)

307 **Qualitative Research Methods** (3) Staff
A general introduction to qualitative research procedures in social science research. Application of qualitative methods, design, analysis. Required of all GSEHD doctoral students.

308 **Practicum in Qualitative Research Methods** (3) Staff
The development of data collection and analysis skills through the conduct of field-based qualitative research. Prerequisite: Educ 307.

320 **The Politics of Education** (3) El-Khawas
Examination of the contextual factors (political, economic, and historical) and the nature of political decision making on education issues, primarily at the state and local level. Prerequisite: Educ 271. (Spring)

321 **Economics of Education** (3) Nakib
Economic analysis as it pertains to educational systems and their impact on economic growth. Economic aspects of the conduct and evaluation of policy. Economic principles and theories applied to education problems such as productivity and cost analyses. (Spring)

322 **Education Policy Implementation** (3) Nakib
The evolution and implementation of education policies. Policy implementation at various levels and types of educational systems. Policy is analyzed as a process and as it interacts with organizational, social, economic, and political factors and movements that can hinder or enhance its implementation. Prerequisite: Educ 271 or equivalent. (Fall)

323 **Policies of Education Equity** (3) Nakib
Analysis of the development, implementation, and evaluation of education equity policies, with consideration of their context, formulation, and application. Prerequisite: Educ 271.

329 **Seminar in Program Evaluation** (3) Jackson
Contemporary problems and issues in evaluation of social programs: design, implementation, analysis, and utilization. Prerequisite: Educ 281.

331 **Personnel Administration** (3) Howerton, Lemasters
Human resource management: planning, recruitment, selection, placement and induction, staff development, rewards, and negotiations. Issues and legislation that influence personnel functions and policy; communication skills for human resource leadership. (Fall)

334 **Doctoral Internship in Educational Policy** (3 to 6) Jackson
Supervised internship in education or human services settings for advanced doctoral students. (Fall, spring, and summer)

340 **Methods of Policy Analysis in Education** (3) Futrell, Rotberg
Methods of analysis used in the study of educational policy issues. Case studies on a range of policy issues and trends, including testing and accountability, school finance, school choice, and the federal role. Prerequisite: Educ 295. Prerequisite: Educ 271. (Fall)

345 **Advanced Studies in Educational Policy Analysis** (3) Rotberg
The process by which federal policy is made and implemented by states and school districts. Case studies. Assumptions and objectives; criteria for assessing effectiveness; and federal, state, and local roles. Prerequisite: Educ 271. (Spring)

353 **Seminar: Higher Education Administration** (3) Brown

354 **Seminar: Administration and Supervision** (arr.) Staff

355 **Seminar: Applied Educational Administration** (3 to 6) Lemasters
Application of the theories and principles of administration to public and private schools. Field experience in a phase of administration and supervision. Admission by permission of instructor.

369 **School Business Management** (3) Staff
Management and control of the business functions of school districts. Assessing, planning, developing, and presenting educational budgets; the legal contexts affecting school business management. Risk management and school-site budgeting. (Fall)

370 **Federal Higher Education Policy** (3) El-Khawas and Staff
Assessment of federal policies that impact higher education; policy networks and mechanisms of policymaking. (Spring)

372 **Doctoral Internship in Higher Education Administration** (3 to 6) Staff
Service in a higher education situation directed by the University and the cooperating institution to integrate theory and practice. Admission by permission of instructor. (Fall, spring, and summer)

373 **The Community/Junior College** (3) Staff
The two-year college as it relates to secondary education, four-year colleges, and universities. Objectives, curricula, students, faculty, legal concerns, and special problems of two-year colleges.

374 **Current Issues in Higher Education** (3) Brown, Ferrante
Prerequisite: Educ 283, 284. (Summer)

378 **Financing Higher Education** (3) Brown
Analysis of private, state, federal, and other revenue sources; strategic planning, program budgets, and financial methods and practices. (Fall)

379 **Administration and Governance of Two-Year Colleges** (3) Staff
A study of the community/junior college, focusing on administrative and governance patterns and national, regional, state, and local influences, as well as the theory and structure of two-year college organization.

380 **Legal Problems in Higher Education** (3) Staff
Investigation of legal problems in higher education related to the legal structure of higher education, religious concerns, students, faculty, and academic programs. (Summer)

381 **College and University Curriculum** (3) Confessore
Development, patterns, creative design, issues, problems, evaluation, and trends in the higher education curriculum. (Summer)

382 **Teaching Strategies for Adult Learners** (3) Confessore
Designing, implementing, and evaluating instructional strategies for adult learners. Assessing needs, writing objectives, selecting curriculum/content, selecting and implementing methods and techniques, selecting appropriate mediating devices, and evaluating instruction.

384 **College and University Governance** (3) Confessore
Organizational and administrative structures, patterns, and relationships in higher education. Prerequisite: Educ 284.

385 **Problems and Practices in Educational Administrative Organization** (3 to 6) Brown
Application of principles and practices concerned with change and evaluation of educational administration.

387 **Internship: Administration** (3 to 6) Howerton, Lemasters
Service in an educational institution or education-related program directed by the University's faculty.

388 **Case Studies in Higher Education Administration** (3) Brown, Ferrante
An analysis of case studies related to administrative functions in colleges and universities.

390 **Pre-Dissertation Seminar** (3 to 6) Staff
Required of all departmental Ed.D. degree candidates. Approval of the dissertation research proposal by the dissertation committee is necessary for successful completion of the seminar. Admission by permission of instructor.

391 **Dissertation Research** (3 or 6) Staff
Prerequisite: Educ 390.

ELECTRICAL AND COMPUTER ENGINEERING

Professors W.K. Kahn, H.J. Helgert, R.H. Lang, N. Kyriakopoulos, T.N. Lee, E. Della Torre, R.J. Harrington, W. Wasylkiwskyj, N.A. Alexandridis, M.H. Loew, R.L. Carroll, Jr., M.E. Zaghloul, M. Pardavi-Horvath, B.R. Vojcic (*Chair*), H. Szu (*Research*), D. Nagel (*Research*), J.N. Pelton (*Research*), K.B. Eom, C.E. Korman, T. El-Ghazawi, L. Bennett (*Research*)
Associate Professors D. Saha, M. Doroslovacki, Z. Guo, S. Subramaniam
Assistant Professors J.M. Zara, S. Ahmadi (*Research*), E. Larsson
Adjunct Professors A. Schneider, W.D. Jackson, D.M. Le Vine
Associate Professorial Lecturer M.R. Berman

See the School of Engineering and Applied Science for programs leading to the master's, professional, and doctoral degrees. The department also offers certificate programs in computer architecture and networking, optical communications and networks, telecommunications networks, telecommunications security and electronic warfare, and wireless and mobile networks.

201 **Microcomputer Systems Architecture** (3) Alexandridis and Staff
CISC, RISC microprocessors. Superpipelined and superscalar processors. Buses, timing, and system interface protocols. Advanced memory designs. Multilevel cache designs. Architectural support for memory management, protection, task switching, and exception handling. Multiprocessor systems. Prerequisite: ECE 181, 182, or permission of instructor. (Fall and spring)

202 **Linear Systems Theory** (3) Kyriakopoulos and Staff
Introduction to linear systems theory. Topics include linear vector spaces and linear operators, mathematical representation of dynamic linear systems, concept of state and solution of the state equation, controllability and observability, canonical forms of the state equation, state feedback, and state estimation. (Fall)

203 **Stochastic Processes in Engineering** (3) Vojcic and Staff
Basic concepts of modeling of random phenomena in electrical and computer systems: probability framework, stationarity, linear filtering. Optimization of discrete and continuous stochastic processes. Elements of performance analysis. Prerequisite: ECE 12, ApSc 115, or equivalent. (Fall and spring)

204 **Embedded Systems** (3) Alexandridis and Staff
System-level design methodology and tools. Embedded microprocessors. Real-time systems. Models and specification languages. Process scheduling. Hardware/software co-design. Interfacing methods and interrupt synchronization. Behavior–architecture co-design. Data acquisition and control systems. Prerequisite: ECE 201 or permission of instructor. (Fall and spring)

205 **Fractals and Their Applications** (3) Loew and Staff
Contemporary methods in fractal analysis. Basic mathematics of fractals; fractal dimension; fractional Brownian motion and generalized dimensions/iterated function systems; fractal interpolation functions, fractal dimension in 3D. Morphology. Models and image compression. Student research projects. Prerequisite: ECE 203 and either 211 or 219. (Spring, even years)

206 **High-Performance Processors** (3) Alexandridis and Staff
Instruction-level parallelism in superscalar processors. Multiple-instruction fetching, aligning, merging, and issuing. Hardware and software solutions to data dependencies and control hazards. Branch prediction and static and dynamic speculation. Register renaming, reorder buffers, Tomasulo, software pipelining. VLIWs, EPIC. Prerequisite: ECE 201 or permission of instructor. (Spring)

207 **Parallel Computer Architecture** (3) El-Ghazawi and Staff
Architectural classifications and taxonomies of parallel computers; enabling technologies, including advanced processor concepts, interconnection networks, high-speed memory architectures and protocols; parallel performance and scalability; and introduction to parallel algorithms and parallel programming. Prerequisite: ECE 201 or permission of instructor. (Fall)

208 **Digital Image Processing** (3) Loew and Staff
Properties of images and visual systems. Image acquisition, sampling, quantization. Image transform techniques; enhancement and restoration. Image coding and data compression. Segmentation, representation, boundary and shape, texture, matching. Image understanding. Computer applications and projects. Prerequisite: ECE 202 or permission of instructor. (Spring, odd years)

209 **Compression Techniques for Data, Speech, and Video** (3) Eom
Lossless and lossy coding theorems, rate distortion bound. Data compression algorithms: Huffman coding, run-length coding. Differential coding. Transform coding. Voice, audio, image and video coding techniques: CELP, JPEG, MPEG, MP3. Data coding standards: G.722, G.726, G.728, H.261, H.323. Prerequisite: ECE 203, 211, or permission of instructor. (Fall)

210 **Applied Electromagnetics** (3) Lang and Staff
Review of Maxwell's equations; electromagnetics of circuits, plane wave propagation; transmission lines; waveguides; radiating systems; receiving antennas and pattern reciprocity, array antennas; electromagnetic properties of materials: conductors, crystals, devices; optical transmission. Prerequisite: ECE 32; ApSc 114. (Fall and spring)

211 **Signals and Transforms in Engineering** (3) Wasylkiwskyj and Staff
Representation of discrete and analog signals as sums of canonical elementary functions; normal equations and the LMS approximation theory, singular value decomposition for discrete and continuous signals; application of classical

transform theory to communications and linear system analysis. Prerequisite: ECE 12; ApSc 114 or equivalent. (Fall and spring)

213 **Modeling of VLSI Circuits** (3) Zaghloul and Staff
Top–down ASIC–FPGA design methodology. Modeling of VLSI circuits using HDL. Behavioral, structural, and RTL modeling techniques; validation and verification techniques. Introduction to logic synthesis. Intellectual property usage. Students design and simulate a project using state-of-the-art commercial VLSI CAD tools. Prerequisite: ECE 126. (Fall)

214 **High-Level VLSI Design Methodology** (3) Zaghloul and Staff
High-level ASIC–FPGA design methodology. RTL modeling of VLSI circuits, using HDL for synthesis. Detailed discussion of logic synthesis. Architectural tradeoff for large VLSI circuits. Advanced optimization techniques. VLSI design flow, using the state-of-the-art, front-end design entry and simulation tools and back-end logic synthesis. Prerequisite: ECE 213. (Spring)

215 **Introduction to MEMS** (3) Zaghloul and Staff
Introduction to MicroElectroMechanical Systems. Microfabrication techniques, bulk micromachining, surface micromachining. Examples of mechanical sensors and actuators, examples of microsystems, interface circuits and MEMS applications. Use of the CAD tools to design MEMS devices. May be taken by undergraduates. Prerequisite: ECE 126 or permission of instructor. (Fall)

216 **Mixed Signal Design** (3) Zaghloul and Staff
Analog signal processing families, discrete time switched capacitor circuits, A/D and D/A converters, samples, modulators, oscillators, and system level circuit design. Prerequisite: ECE 126 or permission of instructor. (Spring, even years)

217 **Neural Networks** (3) Zaghloul and Staff
Theory of neural network models, relation to biological models. Examples of known models. Possible applications of neural networks. Neural network VLSI implementations, digital vs. analog approaches. Building blocks. Examples on realized neural networks. (Fall)

218 **Analog VLSI Circuit Design** (3) Zaghloul and Staff
MOS technology: building blocks, devices, capacitors, limitations. Operational amplifiers and other analog systems. Layout examples and design principles. Students use the CAD VLSI laboratory to design and simulate circuits. Prerequisite: ECE 126 or equivalent. (Spring, odd years)

219 **Computational Techniques in Electrical Engineering** (3) Vojcic and Staff
Introduction to linear algebra and vector spaces as applied to networks and electrical systems. Orthogonal bases, projections, and least squares. Fast Fourier transforms. Eigenvalues and eigenvectors with applications. Computations with matrices. Constrained optimization in electrical systems. Network models and applications. Prerequisite: ECE 12, ApSc 114. (Fall and spring)

220 **Pattern Recognition** (3) Loew and Staff
Random vectors, transformations. Hypothesis testing, error probability, sequential methods. Bayes, other linear classifiers. Discriminant functions, parameter estimation, learning, and dimensionality reduction. Nonparametric methods; clustering; feature selection and ordering. Computer applications and projects. Prerequisite: ECE 203. (Fall, odd years)

221 **Physical Electronics** (3) Pardavi-Horvath and Staff
Theoretical principles underlying the operation of electronic devices. Postulates of quantum mechanics: wave–particle duality, uncertainty relations, Particle statistics. Phonons. Electronic band structure. Metals and semiconductors. Physical principles of semiconductor and optoelectronic devices, lasers, superconductors. Prerequisite: ECE 210. (Fall, odd years)

223 **Photonic Communication Devices** (3) Wasylkiwskyj and Staff
Semiconductor laser fundamentals, quantum mechanics of semiconductor medium; single-mode tunable laser diodes, distributed Bragg reflector laser, distributed feedback laser diodes, doped fiber amplifiers; generation, transmission, demodulation and detection of optical signals, link budget estimates. Prerequisite: ECE 226 or permission of instructor. (Fall, odd years)

224 **Electronics of Lasers** (3) Kahn and Staff
Basic concepts from quantum mechanics, Einstein coefficients, inversion and pumping mechanisms, rate equations. Resonators, He–Ne laser; organic dye

lasers, injection lasers. Nonlinear interactions in lasers. Prerequisite: ECE 221 or equivalent. (Fall, even years)

225 **Device Electronics** (3) Korman and Staff
Semiconductor device concepts; impurity doping, drift diffusion, recombination. Analysis of Schottky and Ohmic contacts, *pn* junctions, MOS systems. Modeling and analysis of semiconductor devices such as MOSFET, JFET, and bipolar transistors. Numerical modeling of semiconductor devices to CAD of VLSI circuits. Prerequisite: ECE 121 or equivalent. (Spring)

226 **Fiber and Integrated Optics** (3) Wasylkiwskyj and Staff
Propagation of light in optical fibers and planar waveguides, absorption and material dispersion effects, polarization, birefringence, spatial and temporal coherence. Components in fiber optic networks: directional couplers, power splitters, tunable filters and diffraction gratings. Prerequisite: ECE 210. (Spring, odd years)

227 **Data and Computer Communications** (3) Alexandridis and Staff
Connecting computers into distributed systems. Computer networks. Local and wide-area networks. Networks of workstations. Internetworking and protocols. Open systems. Programming and software issues. Distributed applications and databases. Prerequisite: ECE 188, 201. (Spring)

230 **Microarchitectures for Multimedia Processing** (3) Alexandridis and Staff
Multimedia architecture and acceleration. Multimedia instructions. Multimedia data (speech, audio, image and video): processing and interfacing requirements. Audio and video compression: algorithms, standards, and hardware design. Parallelism in multimedia processing. Prerequisite: ECE 181, 201 or permission of instructor. (Spring)

231 **Applications of MEMS** (3) Zaghloul and Staff
The design of functional board-level electronic systems involving MEMS devices. Available and emerging MEMS and their use in multidisciplinary system-level applications, including automobile, aerospace, communication, chemical, medical and other industries. Prerequisite: ECE 215 or permission of instructor. (Spring)

232 **Applied Magnetism** (3) Pardavi-Horvath and Staff
Classification of magnetic materials. Magnetic measurements. Soft and hard magnetic materials. Applications to microwave, magnetic recording, permanent magnets, magneto-optics, magnetostrictive devices. Magnetic sensors. Electric power. Superconducting devices. Prerequisite: ECE 210. (Spring, odd years)

233 **Introduction to Microwave Engineering** (3) Kahn and Staff
Transmission lines, scattering parameters, microwave networks, resonators. Modes in uniform waveguides, general characteristics of waveguide junctions. Transfer representations, filters, couplers, symmetrical waveguide junctions. Prerequisite: ECE 210. (Spring, even years)

234 **Wave Propagation** (3) Wasylkiwskyj and Staff
Electromagnetic wave propagation in inhomogeneous and dispersive media, layered media, WKB approximation, geometrical optics, theory of guided waves in closed and open structures, applications to leaky and surface wave antennas. Prerequisite: ECE 210, 211. (Spring, even years)

235 **Antennas** (3) Kahn and Staff
Antenna circuits, radiation pattern, reciprocity, gain, receiving cross-section, scattering by antennas, mutual coupling, arrays. Polarization. Radiation from current distributions, equivalent aperture currents, dipoles, patch antennas, large phased arrays. Prerequisite: ECE 210. (Spring, odd years)

236 **Electromagnetic Radiation and Scattering** (3) Wasylkiwskyj and Staff
Alternative representations of solutions to Maxwell equations, Fourier transforms and spherical mode representations, field equivalence principles, dyadic Green's functions, radiation and scattering by simple shapes, geometrical theory of diffraction, integral equations and the moment method. Prerequisite: ECE 210, 211. (Fall, even years)

237 **Waves in Random Media** (3) Lang and Staff
Propagation and scattering of electromagnetic, optical, and acoustic waves in random media, scattering from rough surfaces and randomly distributed particles, turbulence. Applications to propagation through rain and fog. Laser beam

scintillations, remote sensing, and communications channel modeling. Monte Carlo simulation. Prerequisite: ECE 203, 236. (Fall, odd years)

238 **Remote Sensing** (3) Lang and Staff
Active and passive remote-sensing systems: scatterometers, real-aperture imaging, and synthetic-aperture radars. Sensing of surface, subsurface, and atmospheric parameters at microwave, infrared, and optical frequencies. Analysis of radiometric techniques using radiative transport theory, inverse scattering methods, profile inversion. Prerequisite: ECE 210. (Spring, even years)

239 **Numerical Electromagnetics** (3) Wasylkiwskyj
Numerical methods for the solution of electromagnetic scattering and radiation problems. Major techniques: method of moments, T-matrix and finite element methods, geometrical theory of diffraction and hybrid approaches to solve scattering and radiation by wire structures, surfaces, and composite bodies. Prerequisite: ECE 210, 211, 219. (Spring, odd years)

241 **Information Theory** (3) Saha and Staff
The concepts of source and channel. Measure of information, entropy, mutual information. The noiseless coding theorem. The noisy coding theorem. Channel capacity: symmetric and nonsymmetric channels, Gaussian and binary symmetric channels. Rate-distortion theory. Basics of multiple-user information theory. Prerequisite: ECE 203. (Fall, even years)

242 **Coding Theory** (3) Saha and Staff
Linear codes: parity and generator matrices, syndrome error correction and detection capability, minimum distance. Performance bounds of linear codes, Hamming and Golay codes, Galois fields, shift-register implementation. Cyclic codes. BCH codes: the BCH decoding algorithm, burst-correction codes. Prerequisite: ECE 203. (Spring, even years)

243 **Communication Theory I** (3) Vojcic and Staff
Principles of digital communications. Channels, digital modulation; optimum receivers and algorithms in the AWGN; coherent, non-coherent, and fading channels. Correlation detectors, matched filters, channel state estimation; diversity. Bounds on performance, comparison of communications systems. Prerequisite: ECE 203 or equivalent. (Fall and spring)

244 **Communication Theory II** (3) Vojcic and Staff
Advanced techniques for digital communications. Algorithms for maximum performance in noise, interference, band-limited, and fading channels. Trellis codes, turbo codes; decoding by Viterbi, sequential, and MAP algorithms. Bounds on performance. Current literature on multi-access and space–time methods. Term paper. Prerequisite: ECE 243. (Spring)

245 **Statistical Signal Estimation** (3) Doroslovacki and Staff
Minimum variance unbiased estimation. Cramer–Rao bound, statistical modeling, sufficient statistics, maximum likelihood estimation, efficient estimators, least squares. Bayesian estimators. Wiener and Kalman filters, complex data and parameters. Applications to radar, speech, image, biomedicine, communications, control. Prerequisite: ECE 203, 211, 219. (Fall, odd years)

246 **Digital Communications** (3) Vojcic and Staff
Analysis and design of digital communications systems for voice, video, and data. Digital coding of waveforms: Nyquist criteria, intersymbol interference (ISI). Partial response signaling. Practical considerations in design of signals for modems and recording media. Digital switching and integrated services digital networks. Prerequisite: ECE 244. (Fall, odd years)

247 **Communications Systems** (3) Vojcic and Staff
Digital communications systems. Generation of carrier phase references using phase-locked loops (PLL). Optimum design of PLL. Maximum-likelihood estimation of carrier phase and symbol timing. Performance degradation. Applications to PCM, TDMA, and spread-spectrum systems. Prerequisite: ECE 244 or equivalent. (Spring, even years)

248 **Introduction to Computer Networks** (3) Vojcic and Staff
Fundamental communications network concepts. Architectures for access and internetworking. Data and multimedia transmission techniques, protocols; switched and shared media networks. Routing, error, and flow control; TCP/IP and other Internet protocols. New developments in next-generation Internet. (Fall and spring)

249 **Network Performance Analysis** (3) Subramaniam and Staff
Telecommunications traffic models: arrival and service time distributions, Poisson and Erlang formulas. Topological design algorithms. Delay and blocking models and probabilities for packet switched networks. Routing, relaying, and flow control algorithms: delay and cost minimization, throughput optimization. Multiple access. Prerequisite: ECE 203 and either 248 or 260. (Spring)

250 **Telecommunication Security** (3) Helgert and Staff
Speech and data scrambling. Linear and nonlinear transformations. Cryptographic techniques. Block and stream ciphers. The Data Encryption Standard (DES). Key management, digital signatures, message authentication, hash functions. Public key algorithms. Prerequisite: graduate standing. (Fall)

251 **Telecommunication Switching Systems** (3) Helgert and Staff
Circuit, packet and cell switching. Routing and relaying. Space and time division switching. Switching networks. Storage, delay, blocking and complexity. Digital cross connects, add/drop multiplexers. Digital switching systems. Network timing and synchronization. In-band and common channel signaling networks. Signaling System #7. Prerequisite: ECE 249. (Spring, odd years)

252 **Digital Signal Processing Techniques** (3) Kyriakopoulos and Staff
Signal and system representation, sampling and quantization, transform techniques. Recursive and nonrecursive digital filter design, recursive estimation, linear predictive filtering. Fast algorithms for signal processing. Current topics. Prerequisite: ECE 117 or 211, and 203. (Fall)

253 **Mobile Communication Systems** (3) Vojcic and Staff
Mobile channel characterization. Modulation and coding techniques. Code division multiple access. Fading countermeasures; coding, equalization, and multiple transmit/receive antennas. Power control. Capacity of cellular and ad hoc networks. Structure and evolution of mobile communications networks. Evolving technologies and standards. Prerequisite: ECE 243. (Spring, even years)

254 **Radar Systems** (3) Lang and Staff
The radar range equation. Radar cross section of targets, target detection and parameter estimation, detection in clutter. Resolution, ambiguities, and signal design. Moving-target indicators. Pulse Doppler radar. Radar antennas, phased arrays. Synthetic aperture and space-based radar. Prerequisite: ECE 210. (Fall, odd years)

255 **Optical Communication Networks** (3) Subramaniam and Staff
Wave propagation through fiber, dispersion, polarization. Multiplexing techniques, WDM. Optical networking components. Optical transmission systems design. All-optical networking, broadcast star and wavelength routing networks. Performance analysis, survivability, control and management. Optical access networks. Prerequisite: ApSc 115 or permission of instructor. (Fall)

256 **Wavelets and Their Applications** (3) Doroslovacki
Time-frequency analysis. Continuous, discrete, and discrete-time wavelet transform. Multirate filter banks. Multiband wavelets, two-dimensional wavelets. Wavelet packets. Wavelets in noise filtering, compression, modeling of fractals, communications, detection, adaptive systems, neural networks, and fast computation. Prerequisite: ECE 211. (Fall, odd years)

257 **Multi-User Communications** (3) Vojcic and Staff
Spread-spectrum transmission; direct sequence and frequency hopping. Conventional code division multiple access. Multi-user detection and capacity limits for multi-user communications. High-capacity multi-user communications. Applications to mobile communications and cellular networks. WCDMA, cdma2000, and CDMA/HDR. Prerequisite: ECE 243. (Fall, even years)

258 **Propagation and Antennas in Wireless Communications** (3) Lang and Staff
Wireless communication channel modeling, properties of electromagnetic waves, propagation mechanisms, antenna fundamentals, terrestrial fixed links, satellite fixed links, macrocells, fading models, microcells, picocells, diversity, equalizers, adaptive antennas. Prerequisite: ECE 32 and ApSc 115, or equivalent. (Spring, odd years)

259 **Wireless Networks** (3) Vojcic and Staff
Wireless channels and transmission fundamentals. MAC and link layer protocols for wireless networks. Cellular systems; GSM/GPRS, IS-95 and IMT-2000. Satellite systems. Broadcast systems. Wireless LANs; IEEE 802.11, HIPERLAN

and Bluetooth. Wireless ATM. Mobile IP and TCP. Ad hoc networks. Mobility support; World Wide Web and WAP. Prerequisite: ECE 144. (Fall, even years)

260 **Information Transmission Systems** (3) Helgert and Staff
Transmission media, signals, channels, noise. A/D conversion, data compression, information exchange codes. Carrier modulation, modems and standards. Baseband transmission and codes, synchronization and timing. Multiplexing. Inverse multiplexing. Transmission impairments, error control. DSL systems. Prerequisite: ECE 143 or equivalent or graduate standing. (Fall)

261 **Electromechanical Energy Conversion** (3) Harrington and Staff
Characteristics of synchronous machines, synchronous reactance, reactance theories, synchronizing generators and parallel operation of machines, characteristics of asynchronous machines, machines as circuit elements. Steady-state and dynamic performance of alternating current machines. Prerequisite: ECE 177 and permission of course director. (Fall, odd years)

262 **Power Electronics** (3) Harrington and Staff
Types of power converters and switching matrices. Existence functions and their representation. Control variables. Review of power semiconductor switching devices. Analysis of DC-DC, AC-DC, and AC-AC converters. Circuit interfacing, commutation and control. Prerequisite: ECE 178 and permission of course director. (Spring, even years)

263 **Applications of Power Electronics** (3) Harrington and Staff
Analyses and design of DC and AC variable speed motor drives. Converter topology and switching devices. Detailed performance analysis. Computer modeling of converters. Methods of converter control. Power system applications to generation, transmission, and storage. Prerequisite: ECE 262 or permission of course director. (Spring, even years)

264 **Direct Electrical Energy Conversion** (3) Harrington and Staff
Direct generation and storage of electricity based on charged carrier transport in solid, liquids, and gases. Thermodynamic limitations and the Carnot cycle. Band theory and electrical conduction in semiconductors. Photovoltaic devices and thermoelectric potentials. Electromagnetic turbines and thermionic converters. Prerequisite: Permission of course director. (Spring, odd years)

265 **Transients in Electrical Power Lines** (3) Harrington and Staff
Switching and lightning surges and the resultant overvoltages on long lines. Breaker closing sequence effects and effect of source side inductance and multiple infeeds. Recovery voltage after short line faults. Methods and effectiveness of protection. Calculation of overvoltages and insulation level requirements. Prerequisite: Permission of course director. (Spring, even years)

266 **Power System Control and Stability** (3) Harrington and Staff
EHV AC power transmission, load flow, automatic generation control, economic dispatch, voltage instability, steady state stability, dynamic stability, machine modelling, exciter and governing systems, frequency and voltage control, contingency analysis. Prerequisite: ECE 178 or permission of course director. (Fall, even years)

267 **Power System Operation and Planning** (3) Harrington and Staff
Real time load flow, security assessment, advanced contingency analysis, islanding and system state classification, system restoration, power system reliability, generation and transmission planning, load forecasting, unit commitment, planning with economic and reliability constraints. Prerequisite: ECE 266 or permission of course director. (Spring, odd years)

268 **Electrical Power Distribution** (3) Harrington and Staff
Transformer and insulation design at distribution voltage levels. Medium- and low-voltage switchgear requirements. Protective relaying, harmonic filtering, power-factor correction, grounding systems. Prerequisite: ECE 178 and permission of course director. (Spring, odd years)

269 **Engineering Resources and Environmental Issues in Electrical Power** (3) Harrington and Staff
Introduction to engineering issues involved in selecting electrical power systems. Primary resources. Worldwide distribution. Relation to the developing alternate technology base for power. Environmental, social, economic, and educational considerations. Impact of changing regulations. Prerequisite: Permission of course director. (Fall, odd years)

270 **Protection for Power Systems** (3) Harrington
Typical protective relay systems. Directional sensing of faults. Backup and line protection of generators; transformers; reactors; shunt capacitors; bus, motor, and long EHV series-compensated lines. Stability, reclosing, and load shedding. Systems swings, grounding, and transient overvoltage protection. Prerequisite: ECE 178 and permission of course director. (Fall, odd years)

271 **Linear Multivariable Controls** (3) Carroll and Staff
Control of systems having multiple inputs or outputs. Frequency-domain techniques in linear quadratic Gaussian, loop transfer recovery, H∞, and Nyquist array design. Prerequisite: ECE 172, 202, 273. (Spring, odd years)

272 **Computer Control Systems** (3) Carroll and Staff
Analysis of automatic control systems in which the control procedure uses on-line digital computation. Topics include single- and multirate sampling, z-transforms, responses of discrete systems, stability criteria, and discrete control design. Prerequisite or concurrent registration: ECE 202. (Spring)

273 **System Optimization** (3) Carroll and Staff
Parameter optimization problems, theory of minima and maxima. Optimization problems for dynamic systems, calculus of variations, the maximum principle and the Hamilton–Jacobi equation. Optimization problems with constraints, optimal feedback systems. Numerical solution of optimal problems. Prerequisite: ECE 172 or equivalent. (Spring)

274 **Nonlinear Systems** (3) Carroll and Staff
Definition of linear and nonlinear systems; introduction to approximate analysis of nonlinear systems—describing functions, Krylov and Bogoliubov asymptotical method, and Tsypkin locus. Forced oscillations—jump resonance. Stability analysis—Liapunov criterion. Luré problem and Popov method. Prerequisite: ECE 202. (Spring, even years)

275 **Adaptive Filtering** (3) Doroslovacki and Staff
Adaptation criteria. On-line adaptive filtering algorithms: least mean square and recursive least square. Adaptation in transform domain. Convergence of adaptive algorithms and tracking. Applications in system identification, adaptive channel equalization, interference cancellation and suppression, and adaptive antenna arrays. Neural networks. Prerequisite: ECE 245. (Spring, even years)

276 **Design of Robotic Systems** (3) Carroll and Staff
Topics related to robotics: coordinate transformations, kinematics, dynamics of robot manipulator arms, trajectory planning, sensors, internal transmissions, actuators, robot control systems design, vision systems, and programming languages. Prerequisite: ApSc 58, CSci 100. (Fall)

277 **Satellite Communication Systems** (3) Helgert and Staff
Low earth orbit and geostationary satellite systems. Orbit calculations. Transmission systems. RF link budgets. Modulation and multiplexing. Multiple access techniques: FDMA, TDMA, CDMA. Link budgets. Satellite transponders, antennas, and earth stations. VSAT networks. Satellite packet communications. Prerequisite: ECE 203, 243. (Fall, odd years)

278 **Local and Metropolitan Area Networks** (3) Helgert and Staff
LAN architectures: topologies, transmission media, bridges, routers, gateways. The LAN Protocol Reference Model, IEEE 802. Multiple access procedures: Aloha, CSMA, token passing. Ethernet and Fast Ethernet, token bus, token ring, FDDI, fiber channel, wireless LAN, ATM LAN's. DQDB. LAN interworking, routing and relaying. Prerequisite: ECE 346 or equivalent. (Spring, odd years)

279 **Stochastic Control Systems** (3) Lee and Staff
Introduction to random process in control systems. Properties of Markov process, systems of covariance equivalence and of deterministic and stochastic control equivalence; dynamic programming for Markov process—principle of optimality; linear systems with quadratic cost, Kalman filtering, smoothing, and predicting. Prerequisite: ECE 203, 273. (Fall, odd years)

280 **Anatomy and Physiology for Engineers** (3) Loew and Staff
Human anatomy and physiology from an engineering viewpoint. Analysis of functions of major physiological systems. Biopotentials, mechanics, gas exchange, chemical balance, electrical and chemical signaling, nervous control, voluntary and reflex factors. (Fall)

281 **Speech and Audio Processing by Computer** (3) Eom
Acoustic sensor technologies and characteristics. Speech coding: waveform coding, voice source coding. Speech enhancement and noise reduction. Speech analysis and synthesis, audio formats and compression standards. Speech recognition: isolated word recognition, continuous speech recognition, language identification. Models for speech and audio. Prerequisite: graduate standing. (Fall)

282 **Medical Measurements** (3) Guo and Staff
Theory of measurements in biological areas, techniques for electronic measurements on biological specimens. Experiments in acquisition, processing, and measurement of physiological signals, ECG, EEG, and EMG. Prerequisite: ECE 280 or permission of course director. (Fall)

283 **Medical Instrumentation Design** (3) Guo and Staff
Modern biomedical measurement techniques and instrumentation, including theory of data acquisition, biopotentials, biomedical signal processing, clinical laboratory instrumentation, respiratory system measurements, medical imaging, and prosthetic devices. Prerequisite: ECE 282. (Spring, even years)

284 **Biomedical Signal Analysis** (3) Loew and Staff
Origin, acquisition, and analysis of physiological signals. Deterministic and probabilistic modeling; fitting models; sequences and time series. Feature extraction from EEG and ECG; Fourier analysis and filtering; modeling. Noise and artifact removal and signal compensation. Prerequisite: ECE 203; corequisite: ECE 282. (Spring)

285 **Medical Ultrasound** (3) Guo and Staff
Modern medical ultrasound techniques and instrumentation, including physics of ultrasound, transducers, ultrasound imaging, hemodynamics, Doppler ultrasound and instrumentation, blood-flow measurements, Doppler signal processing, Doppler imaging, three-dimensional ultrasound imaging, and clinical applications. Prerequisite: ECE 11, 282. (Spring, odd years)

286 **Clinical Medicine for Engineers** (3) Loew and Staff
Overview of clinical medicine with emphasis on those areas most affected by engineering and technology. Prerequisite: ECE 282. (Spring, even years)

287 **Rehabilitation Medicine Engineering** (3) Loew and Staff
Cross-sectional view of those areas of medicine most involved with the treatment of handicapped individuals. Application of engineering theory and techniques to the rehabilitation of handicapped individuals. Major problem areas and general solutions, solutions to some specific problems. Prerequisite: ECE 282. (Spring, odd years)

289 **Telecommunications Security Protocols** (3) Helgert and Staff
The OSI security architecture: security services and mechanisms, risk analysis. Internet protocol security mechanisms. Ipv4 and Ipv6 security, security associations, authentication, MD5. Encapsulating security payload. E-mail security: PGP, S/MIME, PEM, MSP. Secure voice communications algorithms. Security in Internet commerce: SSL, SET. Prerequisite: ECE 250, 346. (Spring)

290 **Telecommunications Networks** (3) Helgert and Staff
Traffic characterization. Narrowband and Broadband ISDN. Frame Relay and ATM networks. Local area network architectures and topologies. IEEE 802 protocol standards. Multiple access procedures: Aloha, CSMA, token passing, performance analysis. Ethernet and fast Ethernet, Token Bus, Token Ring, FDDI, Fiber Channel. Prerequisite: ECE 346. (Spring)

291 **Physics of Magnetism** (3) Pardavi-Horvath and Staff
Physics of magnetism in solids, with emphasis on magnetic phenomena used in devices. Fundamental properties of magnetic materials. The origins of magnetism, demagnetizing fields, anisotropy, magnetostriction, domains and coercivity. Prerequisite: ECE 210. (Fall, odd years)

292 **Magnetic Hysteresis** (3) Della Torre and Staff
Hysteresis models. Decomposition into irreversible and locally reversible magnetization. Aftereffect and accommodation. Vector models. Magnetostriction and magnetothermal effects. Prerequisite: ECE 210. (Spring, even years)

293 **Image Synthesis** (3) Eom
Image synthesis techniques, mathematical image models, image reconstruction techniques, color texture synthesis, synthesis of three-dimensional scenes. Prerequisite: graduate standing. (Spring)

294 **DSP Embedded Systems** (3) Doroslovacki
Digital signals, binary number representation, fixed-point and floating-point DSP architectures. Q-format for data representation, bit allocation and arithmetic. Portability of arithmetic expressions: floating point vs. fixed point. Applications to signal parameter estimation, signal generation, filtering, signal correlation, spectral estimation (FFT). Prerequisite: ECE 201. (Spring, odd years)

295 **Electronic Warfare** (3) Helgert and Staff
Electronic attack and protection of information resources. Countermeasures and counter-countermeasures. Electronic attacks on ranging and tracking radar systems, jamming and jamming defense. Electronic attack on communications systems. Defensive techniques, signal design, spread spectrum. Attack and defense of optical and high-energy systems. Prerequisite: ECE 289. (Fall, odd years)

297 **Special Topics** (1 to 3) Staff
Topics to be announced in the *Schedule of Classes*. (Fall and spring)

298 **Research** (arr.) Staff
Applied research and experimentation projects, as arranged. May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

306 **Advanced Topics in Computer Engineering** (3) Alexandridis and Staff
Overview of parallel computing. Compilers/parallelizers. Design of parallel algorithms. Benchmarks. Fault tolerance and load balance. Parallel performance modeling. Vector/matrix products. Interprocess and interprocessor communication. Parallel algorithms for numerical techniques. Prerequisite: CSci 270, ECE 220. (Fall, even years)

317 **VLSI for DSP Systems** (3) Zaghloul and Staff
VLSI design techniques as applied to DSP systems. CAD tools and standard library design techniques; algorithms and architectures for DSP systems in VLSI. Systolic arrays; parallel and pipelined architecture in DSP. Transform and digital filter algorithms. Prerequisite: ECE 252. (Spring, odd years)

318 **Mobile Networked Computing** (3) Alexandridis and Staff
Microarchitectures for the mobile, handheld, and transport application domain. Collaborative computing. Models of distributed computing systems. Handling locality migration, caching for intermittent connectivity and location-dependent information. Mobile network interface devices. Concurrency. Adaptations for mobile computing. Prerequisite: ECE 201. (Fall)

319 **Controls, Systems, and Signal Processing Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

320 **Computer Vision** (3) Loew and Staff
Image processing; edge detection, segmentation, local features, shape and region description in 2D and 3D. Insights from human vision studies. Representation for vision: object models, synthetic images, matching, gaps, algorithms. Interference, production system, syntactic networks. Planning spatial reasoning for robot vision. Prerequisite: CSci 270; ECE 220. (Spring, even years)

321 **Mathematical Techniques for Electromagnetics** (3) Lang and Staff
Asymptotic methods for Maxwell's equations, geometric optics, WKB approximation for stratified media, uniform expansion near a caustic and shadow boundary. Perturbation techniques for tenuous medium: Rayleigh–Gans approximation, smoothing, and multivariable methods for stochastic problems. Prerequisite: ECE 203, 236. (Spring, every third year)

322 **Waveguide Diffraction** (3) Kahn and Staff
Selections from the following. Analytical treatment of waveguide bifurcations and discontinuities by Wiener–Hopf, mode matching, static approximation. Small apertures (obstacles) in waveguides. Variational methods for evaluation of equivalent circuit parameters. Group theoretic methods for symmetrical junctions. Prerequisite: ECE 236. (Fall, every third year)

329 **Electromagnetic Engineering Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

335 **Signal Processing Array Antennas** (3) Wasylkiwskyj and Staff
Review of antenna theory; radiation and reception by array antennas; antenna arrays as multiport receivers. Angle-of-arrival estimation using MUSIC and re-

lated techniques. Application to communications and radar. Prerequisite: ECE 203, 235. (Spring, even years)

346 **Telecommunications Protocols** (3) Helgert and Staff
Layered protocol models for computer communications networks. Open systems interconnection reference model. CCITT and ISO protocol standards in support of OSI. Proprietary communications architectures. TCP/IP, SNA, and DNA. Protocols for local area networks and integrated services digital networks. Prerequisite: ECE 248. (Fall, even years)

347 **Telecommunications Software Engineering** (3) Helgert and Staff
Formal description techniques for protocol specification. Graphic and matrix representations of finite-state protocol models. Specification and Description Language (SDL) and CCITT High-Level Language (CHILL). Software implementations of computer communications protocol architectures. Prerequisite: ECE 346. (Spring, odd years)

348 **The Internet: Design and Implementation** (3) Helgert and Staff
Physical architecture: transmission systems, bridges, gateways, routers, servers, and hosts. Service structures: NBP, NAP, ISP. Protocol architecture. Transmission, routing, and application protocols. The Web: CGI, HTTP, search engines, and browsers. Security: access control, firewall, packet filters, integrity mechanisms. Software issues. Prerequisite: graduate standing. (Spring, even years)

349 **Communications Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit. (Fall and spring)

364 **Direct Energy Conversion** (3) Harrington and Staff
Electrostatic and magnetic conversion systems, conversion of heat to electricity, thermoelectric systems, conversion of light to electricity, fuel cells and batteries, magnetohydrodynamic systems, superconductive machines and systems. Prerequisite: ECE 264. (Spring, even years)

368 **High-Voltage Test Techniques** (3) Harrington and Staff
Methods and procedures for measurement of high voltage; basic testing techniques for alternating voltages, direct voltages, lighting-impulse voltages, switching-impulse voltages, and impulse currents. Determination of the dielectric strength of electrical insulation materials at power frequencies. The use of sphere gaps for the measurement of peak values. (Spring, even years)

372 **Control of Large Systems** (3) Lee and Staff
Systems as multistage decision processes. Analytical concepts of model making and matrix representations of large systems. Approximation by models of lower dimension: reduction to simplified models, decentralized systems. Differential games, computation of saddle points, construction of an equilibrium point. Prerequisite: ECE 273. (Fall, even years)

382 **Biomedical Signals and Systems** (3) Guo and Staff
Techniques for quantitative analysis of biomedical signals and systems; application to practical problems. Physiologic system modeling and control; wavelets. Weekly computer-based assignments involve analysis of simulated and actual biomedical data. Prerequisite: ECE 284 or permission of instructor. (Fall, even years)

383 **Bioelectric Phenomena and Bioelectromagnetics** (3) Loew and Staff
Mathematical treatment of bioelectric phenomena: membrane, dynamics, potentials, and subthreshold effects; solid-state phenomena; nerve propagation. Electromagnetic interactions with biological systems; energy absorption and heat production; diagnostic and therapeutic applications of electromagnetic energy. Prerequisite: ECE 210, 283. (Fall, even years)

384 **Medical Imaging** (3) Loew and Staff
Principles of projection radiography, fluoroscopy, tomography, ultrasound, and nuclear sources (PET, SPECT); biomagnetic imaging. Characterization of source and object; recorder resolution and noise. Scatter and attenuation. Reconstruction algorithms and implementations for CT and MRI. Recent developments. Prerequisite: ECE 211 or equivalent, 284. (Fall, odd years)

385 **Special Topics in Medical Engineering** (3) Loew and Staff
Exploration of theoretical or technical advances in medical engineering. Topic to be announced in the *Schedule of Classes*. (Fall and spring)

389 **Medical Engineering Research** (arr.) Staff
Limited to students working on the Doctor of Science dissertation. May be repeated for credit. (Fall and spring)

390 **Colloquium** (0) Lang and Staff
Lectures by outstanding authorities in electrical and computer engineering. Topics to be announced each semester. (Fall and spring)

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

ENGINEERING MANAGEMENT AND SYSTEMS ENGINEERING

Professors R.M. Soland, R.C. Waters, E.L. Murphree, Jr., H. Eisner, G.R. Brier, J.R. Harrald, S. Sarkani, G. Frieder, T.A. Mazzuchi (*Chair*), J.P. Deason
Associate Professors M.R. Duffey, M.A. Stankosky, H. Abeledo, J.A. Barbera, J.R. van Dorp
Assistant Professors T. Jefferson, J.C. Ryan, M.P. Hamner, A. Bada, E. Campos-Nanez
Adjunct Professors R.R. Romano, G.M. Gerson
Professorial Lecturers W.A. Goetz, S.F. Pauls, R.M. Andersen, F.R. Power, W.P. Henderson, F. Allario, C.R. Cothern, D.J. Ryan, L.W. Transeau, C.H. Voas, J.E. Collins, M.G. Goode, D.R. Skeen, F.A. Calabrese, J.F. Starns, R.C. West
Associate Professorial Lecturers R.D. Hofler, P.A. Massimini, P.G. Meikle, B.L. Lewis, S.V. Massimini, D.M. Chadwick, J.E. Beach, D.D. Steeples, S.S. Gambhir, R.B. Garrity
Assistant Professorial Lecturers C.H. Bixler, T.H. Holzer, J.R. McCumber

See the School of Engineering and Applied Science for programs leading to the master's, professional, and doctoral degrees. Certificate programs offered by the Department of Engineering Management and Systems Engineering include homeland security emergency preparedness and response, emergency management and public health, engineering and technology management, information security management, knowledge and innovation management, and systems engineering.

201 **Survey of Operations Research: Deterministic Models** (3) Abeledo and Staff
Basic concepts and techniques of deterministic operations research modeling as applied to problems in industrial and governmental decision making. Linear, integer, nonlinear, and dynamic programming; networks; game theory. Prerequisite: Math 32 or permission of instructor. (Fall)

202 **Survey of Operations Research: Stochastic Models** (3) Campos-Nanez and Staff
Basic concepts and techniques of stochastic operations research modeling as applied to problems in industrial and governmental decision making. Markov chains, queuing, inventory, regression analysis, forecasting, reliability analysis, and simulation. Prerequisite: ApSc 115, Math 32, or permission of instructor. (Spring)

204 **Management of Engineering Contracts** (3) Murphree and Staff
Study of the total contracting process (including initial budget preparation and justification, execution of a contract, and administration of the contract to completion) considered from the viewpoints of the industrial and government buyer and the seller of technical materials and services. (Fall)

207 **The Human Resources Function for Engineering Managers** (3) Hamner and Staff
Principles, theory, and practical considerations of the human resources function, with applications for engineering management. Issues and case studies examined within the context of the totality of the process of management as well as the dynamics of human resources management. (As required)

208 **Stochastic Foundations of Operations Research** (3) Soland and Staff
Topics in probability theory, stochastic processes, and statistical inference. Foundations of probability, conditional probability and expectation, Poisson processes, Markov chains, and Brownian motion. Prerequisite: ApSc 116 or permission of instructor. (Fall)

209 **Mathematics in Operations Research** (3) Abeledo and Staff
Mathematical foundations of optimization theory: linear algebra, advanced calculus, and real analysis. Geometrical interpretations. Numerical methods and use of software. Applications to modeling techniques in operations research. Prerequisite: Math 33. (Spring)

210 **Engineering Law** (3) Stankosky and Staff
Legal principles and procedures of interest to engineers. The American legal system, contracts and specifications, liability of professional engineers, product

liability, agency relationships, patent and proprietary rights, special problems in research and development contracts. (As required)

211 **Organizational Behavior for the Engineering Manager** (3) Hamner and Staff
Behavior at the engineering organization level. Emphasis on changing engineering organizations and their cultures and on increasing their effectiveness. Includes evaluating and selecting engineering organization structures, considering influences on their design, and reviewing work design and encouraging innovation. (Fall)

212 **The Management of Technical Organizations** (3) Waters and Staff
The practice of management as applied within technical organizations. Includes history of the tradition and current effective practices, research findings, and case studies, with objectives of enhanced understanding of external and internal factors influencing organizational performance and leadership requirements. (Fall, spring, and summer)

216 **Research Methods for the Engineering Manager** (3) Mazzuchi and Staff
Advanced course in research, experimental, and statistical methods for engineering management. Prerequisite: EMSE 269 or permission of instructor. (Fall)

217 **Fundamentals of Artificial Intelligence** (3) Stankosky and Staff
History of AI, expert systems, knowledge representation, search and control techniques, natural language processing, computer vision, computer speech, knowledge-based systems, and evidential reasoning. Hands-on experience with a knowledge-based shell. (Spring)

218 **Management of Information and Systems Security** (3) Ryan and Staff
Development and management of effective security systems. Includes information, personnel, and physical security. Emphasis on risk analysis for information protection. (Fall and summer)

219 **Object-Oriented Analysis and Design** (3) Jefferson and Staff
The object-relationship model and the object-behavior model. Managing complexity with views and high-level modeling in object-oriented systems analysis. The concepts, the method, and applications, including object-based and object-oriented languages. Prerequisite: EMSE 250. (Spring, even years)

220 **Policy Factors on Environmental and Energy Management** (3) Deason and Staff
Exploration of the policy development process from several different but integrated perspectives. Focus on areas of environmental and energy management and use of current case studies to develop a framework of understanding to support decisions in a broad variety of management settings. (Fall, odd years)

221 **Environmental Management** (3) Deason and Staff
Technical, economic, political, administrative, and social forces influencing the quality of the environment and the use of resources. Government and industrial programs to combat pollution of the air, soil, and water; existing and pending pertinent legislation; theoretical aspects of specific management problems. (Fall)

222 **Energy Management** (3) Deason and Staff
Examination of the range of available energy resources, trends in their use, the programs and organizations that have developed and evolved to address problems associated with energy resource use. (Spring)

223 **Air Quality Management** (3) Deason and Staff
The nature of critical local, regional, continental, and global problems associated with air pollution and the historical evolution of such problems. The complex regulatory and institutional framework controlling air quality management in the U.S. Current air quality management concepts and processes. (Spring)

224 **Analytical Tools in Environmental Management** (3) Deason and Staff
A survey course in environmental management, focusing on tools to assess the environment: cost benefit analysis, land use, comprehensive planning. Congressional activities, and environmental laws. The regulatory process as it relates to environmental management. Risk assessment methodology. Modeling approach to solving environmental problems. (Spring, odd years)

225 **Hazardous and Toxic Waste Management and Cleanup** (3) Deason and Staff
Hazardous waste management and cleanup processes used in the U.S. and around the world. The roles of the relevant federal, state, and local government

agencies; major hazardous and toxic waste laws and regulations. Planning, assessment, investigation, design, and construction phases of toxic and hazardous waste remediation projects. (Summer)

226 **Water Quality Management** (3) Deason and Staff
The nature of point and non-point sources of surface and ground water pollution and the statutory, regulatory, and institutional framework controlling water quality management activities in the U.S. Current approaches to water quality protection and enhancement. The role of engineered treatment processes in water quality management. (Fall)

227 **Analytical Tools for Energy Management** (3) Deason and Staff
Analytical tools needed to manage energy resources at the facility level. Energy technologies: instrumentation, measurement, and control. Energy auditing; conservation techniques, financial and economic analysis, and maintenance of energy budgets. Functions of an energy management office of a large organization. (Fall, even years)

230 **Homeland Security: The National Challenge** (3) Harrald and Staff
The evolution of homeland security as a major function of the federal government; analysis of the existing homeland security policy framework and current issues. (Fall and spring)

231 **Program and Project Management** (3) Eisner and Staff
Problems in managing projects; project management as planning, organizing, directing, and monitoring; project and corporate organizations; duties and responsibilities; the project plan; schedule, cost, earned-value and situation analysis; leadership; team building; conflict management; meetings, presentations, and proposals. (Fall)

232 **Crisis and Emergency Management** (3) Harrald and Staff
Concepts and problems of crisis and emergency management. Defining crises, emergencies, and disasters. Developing crisis and contingency plans. The Federal Response Plan and National Contingency Plan, organizing for response, managing the response organization, managing in a turbulent environment, crisis decision making and communication. (Fall)

233 **Information Technology in Crisis and Emergency Management** (3) Harrald and Staff
The role of information in crisis and response management; determining disaster and crisis information requirements; information technologies applied to crisis, disaster, and emergency management; causes and effects of information breakdowns during crises and disasters. (Spring)

234 **Management of Risk and Vulnerability for Natural and Technological Hazards** (3) van Dorp and Staff
Development of concepts required for risk-based planning and risk management. Objectives and methods for vulnerability assessment for natural disaster, technological hazards, and terrorist threats. Risk analysis, risk perception, risk communication, risk mitigation. (Fall)

235 **Systems Thinking and Policy Modeling I** (3) Campos-Nanez and Staff
Stock-flow analysis of feedback systems presented for policy analysis and management. System dynamics; principles of systems employed to structure the problem-solving process. Problems and case studies solved using microcomputers. (Fall)

236 **Systems Thinking and Policy Modeling II** (3) Campos-Nanez and Staff
Case studies in dynamic policy analysis. Use of microcomputers in simulation. The class collectively models and simulates a social system to explore policy options. Prerequisite: EMSE 235. (Spring, odd years)

237 **Logistics Planning** (3) Mazzuchi and Staff
Quantitative methods in model building for logistics systems, including organization, procurement, transportation, inventory, maintenance, and their interrelationships. Stresses applications. Prerequisite: ApSc 115, Math 33. (Spring, odd years)

238 **Current Issues in Emergency and Crisis Management** (3) Harrald and Staff
Coverage of the major international institutions, systems, processes, and operational components involved in international crisis and disaster responses encompassing natural and man-made disasters. (Fall)

239 **Health and Medical Issues in Emergency Management** (3) Barbera and Staff
Health and medical management issues involved in crises and emergencies presented for the non-medical emergency manager. Methods for integrating medical

and public health processes into emergency management programs. (Spring, odd years)

240 **Terrorism Preparedness** (3) Barbera and Staff
Terrorists, their motives, methods, and targets, and the implications for emergency management mitigation, preparedness, response, and recovery. Vulnerability of critical infrastructure and other civilian targets. Risk assessment and emergency management intervention. Local, national, and international resources and initiatives to prepare for mass terrorism incidents. (Fall)

241 **Introduction to Management of Construction** (3) Murphree and Staff
How the construction industry worldwide works: feasibility studies; organization for construction; financing and cost accounting for construction; design and engineering contracts and procedures; construction contracts; change orders and delays; acceleration; claims, arbitration, mediation, litigation; labor management; project planning. (Fall, even years)

242 **Construction Project Management** (3) Murphree and Staff
Applications of CPM concepts; owner and contractor viewpoints and needs; subcontractor relations and control; use of computer software (Primavera) to follow an example construction job from concept through design and contract award, and construction; attention to change orders, weather-caused and other delays; acceleration; claims; job closeout. (Spring, odd years)

243 **Construction Cost Management** (3) Murphree and Staff
Cost estimating and control for owner and contractor from project concept through construction, operation and maintenance, to disposal. Parametric cost estimating; budget estimates during design; detailed quantity takeoff and pricing from completed designs; bid preparation; financing alternatives; cost control during construction; computers in cost control. (Spring)

245 **Facilities Operation and Maintenance Management** (3) Murphree and Staff
Economic issues in facilities management; planning and organization for maintenance; energy and environmental issues; strategies; day-to-day operation and maintenance; estimating with standard production models; computers in maintenance operations; contracts for maintenance: preparation and administration; facility obsolescence, recycling and disposal. (Spring)

246 **Reliability Analysis and Infrastructure Systems** (3) Sarkani and Staff
Modeling basic variables and defining the limit–state surface. Computing the reliability index of an infrastructure system by approximating the limit–state surface—FORM and SORM. Modeling an infrastructure system. Reliability analysis using branch and bound, failure paths and failure modes, identification of dominant failure paths. Case studies. (Fall)

250 **Information and Software Engineering** (3) Jefferson and Staff
Introduction to analysis and design of information systems including requirements analysis, project management, and software architectures. Introduction to CASE tools. Prerequisite: EMSE 256 or permission of instructor. (Fall)

251 **Linear Programming** (3) Abeledo and Staff
The simplex method and its variants, considered from theoretical and computational points of view. Duality and sensitivity analysis. Decomposition methods for large-scale problems. Network flow problems. Prerequisite: EMSE 209 or permission of instructor. (Fall)

252 **Nonlinear Programming I** (3) Abeledo and Staff
Basic theoretical and computational topics in optimization theory, including convexity and the optimality conditions. Algorithms for solving unconstrained, linearly constrained, and nonlinearly constrained problems. Applications. Prerequisite: EMSE 209 or permission of instructor. (Spring)

253 **Integer and Network Programming** (3) Abeledo and Staff
Combinatorial optimization problems: algorithms and applications. Network problems: minimum spanning tree, shortest path, maximum flows, minimum cost flows, optimal matchings, routing problems. Complexity theory. Enumeration and cutting plane methods for solving integer programs. Prerequisite: EMSE 251 or permission of instructor. (Spring, odd years)

254 **Applied Optimization Modeling** (3) Abeledo and Staff
Analysis of optimization models, including areas of nutrition, water pollution, energy, reliability, inventory control, game theory, chemical equilibrium, port-

folio selection, and parameter estimation. Solution of models via the GAMS modeling software. Prerequisite: EMSE 201 or permission of instructor. (Fall)

255 **Management of Research and Development** (3) Waters and Staff
Study of technological innovation as a vital part of the organizational adaptation process. Role of the technical manager in using organization, planning, and motivation to accomplish research and development objectives. (Spring, even years)

256 **Information Management and Information Systems** (3) Jefferson and Staff
The use of information in organizations, the management of the information resource; the impact of information and communication technology. (Fall, spring, and summer)

257 **Production Design** (3) Duffey and Staff
Consideration of production design and operations in the context of an integrated company strategy. Process and trade-off analyses, capacity management and planning, technology planning. (As required)

260 **Survey of Finance and Engineering Economics** (3) Duffey and Staff
Survey of material relevant to financial decision making for engineering activity. Includes traditional engineering economy topics; fundamentals of accounting; and financial planning, budgeting, and estimating applicable to the management of technical organizations. (Fall, spring, and summer)

261 **Economic Analysis in Engineering Planning** (3) Duffey and Staff
Case studies in engineering economic analysis, capital budgeting, benefit–cost analysis, and other cost-related methodologies relevant to engineering managers. Prerequisite: EMSE 260 or permission of instructor. (Fall)

262 **Finance for Engineers** (3) Waters and Staff
Financial analysis and concepts useful to engineers: sources and uses of funds, management of working capital, leverage, valuation, forecasting, investment decisions. Prerequisite: EMSE 260. (Fall)

267 **Theory of Games** (3) Abeledo and Staff
Mathematical models of conflict and cooperation with applications in economics, business, defense, transportation, and societal issues (voting schemes, fair division, auctions). Concept and computation of equilibrium in n-person games. Prerequisite: Math 33. (Fall)

268 **Decision Analysis** (3) Soland and Staff
Decision making under certainty, uncertainty, and one and several criteria. Decision analysis and decision trees, value of information, subjective probability and Bayesian statistics, utility and value theories, multiple-criteria decision making and optimization, goal programming. Prerequisite: ApSc 116 and EMSE 201; or permission of instructor. (Fall, even years)

269 **Elements of Problem Solving and Decision Making for Managers** (3) Mazzuchi and Staff
Problem formulation. Concepts and techniques used in analyzing complex decision problems. Modeling decision problems using decision trees, probability models, multi-objective models and utility theory. (Fall, spring, and summer)

270 **Knowledge Management I** (3) Stankosky and Staff
The foundations of knowledge management, including cultural issues, technology applications, organizational concepts and processes, management aspects, and decision support systems. Case studies. (Fall)

271 **Data Analysis for Engineers and Scientists** (3) Mazzuchi, van Dorp, and Staff
Design of experiments and data collection. Regression, correlation, and prediction. Multivariate analysis, data pooling, data compression. Model validation. Prerequisite: ApSc 115. (Fall)

272 **KM: Leadership and Management** (3) Stankosky and Staff
Leadership and management issues surrounding the design and implementation of a knowledge management system. Knowledge as a strategic asset; the roles of the chief executive officer, chief knowledge officer, and general managers with respect to a KMS and systems thinking. (Fall)

273 **Discrete Systems Simulation** (3) van Dorp and Staff
Simulation of discrete stochastic models. Simulation languages. Random-number/random-variate generation. Statistical design and analysis of experiments, terminating/nonterminating simulations; comparing system designs.

Determination of input distributions. Variance reduction. Validation of models. Prerequisite: ApSc 116, CSci 51, or permission of instructor. (Spring)

274 **The Learning Enterprise** (3) Stankosky and Staff
Social engineering and organizational dynamics that support business transformation, leading to the ultimate "learning organization." Cultural change and learning strategies that impact the enterprise's efficiency, effectiveness, and innovation. (Fall)

275 **Knowledgeware Technologies** (3) Stankosky and Staff
Information, telecommunication, and web-enabling technologies that support a knowledge management system. Aspects of knowledge management technologies that support the development and implementation of a well-engineered and integrative system. Demonstrations and hands-on experience. (Spring)

276 **KM: Organization and Processes** (3) Stankosky and Staff
The role of business processes and organizational models that are conducive to an effective knowledge management system. Integration of knowledge flows, metrics, benchmarking, continuous process improvement, and business process reengineering. (Spring)

277 **Queuing Theory** (3) Mazzuchi and Staff
Single-channel exponential queuing systems, Markovian single- and multiple-channel models, including birth–death processes, finite sources, Erlangian models. General arrival and service patterns. Jackson networks. Model building, basic solution techniques, and formal theoretical developments. Prerequisite: EMSE 208 or permission of instructor. (Spring, even years)

279 **Inventory Control** (3) Mazzuchi and Staff
Mathematical techniques applied to decisions about when and how much to produce or purchase. Mathematical models of inventory systems with deterministic and stochastic demands, continuous and periodic review policies, multi-item models with constraints, multi-echelon models. Prerequisite: ApSc 116 or permission of instructor. (Fall, odd years)

280 **Techniques of Risk Analysis and Management** (3) Mazzuchi and Staff
Topics and models in current risk analysis; modern applications of risk-based planning and risk management; use of quantitative methods in risk analysis. (Fall, spring, and summer)

281 **Reliability Theory I** (3) Mazzuchi and Staff
Mathematical theory: coherent structures, association of random variables, stochastic characterization of wear, preservation theorems, bounds and inequalities. Statistical theory: probabilistic derivation of failure models; Bayesian methods. Life testing, survival analysis, expert opinion. Prerequisite: EMSE 208 or permission of instructor. (Fall)

282 **Quality Control and Acceptance Sampling** (3) Mazzuchi and Staff
Statistical approaches to quality assurance. Single and multivariate control charts, acceptance sampling by attributes and variables, process capability and design of experiments. Prerequisite: ApSc 115 or permission of instructor. (Spring)

283 **Systems Engineering I** (3) Eisner and Staff
Systems approach to the architecting and engineering of large-scale systems; elements of systems engineering; methods and standards; computer tools that support systems and software engineering; trends and directions; the integrative nature of systems engineering. (Fall, spring, and summer)

284 **Systems Engineering II** (3) Eisner and Staff
Specific applications of systems engineering tools and techniques; student projects. Prerequisite: EMSE 283 or equivalent. (Spring)

285 **Systems Analysis and Management I** (3) Eisner and Staff
The systems or holistic approach as a methodology for making decisions and allocating resources. Analysis by means of objectives, alternatives, models, criteria, and feedback. Prerequisite: EMSE 269 or equivalent. (Fall)

286 **Systems Analysis and Management II** (3) Eisner and Staff
Case studies in systems analysis, including applications to industrial, economic, and military situations. Prerequisite: EMSE 285 or permission of instructor. (Spring)

287 **Decision Support Systems and Models** (3) Stankosky and Staff
Theory of decision making—a cognitive view. Modeling decision maker heuristics and processes. Design, implementation, and evaluation of state-of-the-art

DSS (hands-on). Assess impact of behavioral, situational, and organizational variables. (Fall)

288 **Technology Issue Analysis** (3) Eisner and Staff
Contextual background and intellectual basis for addressing technology issues in the public and private sectors. Technology impact assessment, forecasting, and innovation; principles and practices of technology transfer as elements of a systematic approach to making technology decisions. (Fall, odd years)

289 **Seminar: Evolution of Technology and Organizations** (3) Waters and Staff
Exploration of the evolution of, and connections between, technology and human knowledge, particularly with respect to economic development. Assessment of the role of management in the process of societal change. (Spring, odd years)

290 **Human Factors Engineering** (3) Stankosky and Staff
Study of the human–machine interface applied to system design, job design, and technology management. Human sensory–motor, perceptual, and cognitive functions; task analysis and allocation; contextual aspects of human factors engineering. Modeling, design, and evaluation methodologies. Applications to user-centered industrial and information systems. (As required)

291 **Problems in Operations Research** (3) Soland and Staff
Field experience in operations research on a team basis. Each small group confronts an actual problem and formulates a solution using operations research models. Oral and written reports. Open only to master's candidates in the department during the last year of their program. (Spring)

292 **Special Topics** (3) Mazzuchi and Staff
Selected topics in engineering management and systems engineering, as arranged. May be repeated for credit. Prerequisite: permission of instructor. (Fall and spring)

293 **Technical Enterprises** (3) Murphree and Staff
Essential features of technology-based companies from the entrepreneur's point of view. Team preparation of a simulated business plan for a technology-based company. Designed for those working in technical firms and for government personnel who depend on technical firms as suppliers. (Spring, odd years)

294 **Marketing of Technology I** (3) Stankosky and Staff
Analysis of industrial marketing process and functions, providing concepts and tools for engineering managers to market high technology products and services. (Fall, odd years)

295 **Database Design and Database Management Systems** (3) Jefferson and Staff
Concepts, strategies, and features of database design and management. Analysis, design, and implementation of database systems for micro and mainframe applications. Development of a microcomputer database system. (Fall)

296 **Software Project Development with CASE** (3) Jefferson and Staff
Evaluation and selection of CASE tools, use of CASE tools in software design/project. Graphical user interface and re-engineering tools. Open only to master's candidates in the department during the last semester of their program. Prerequisite: EMSE 250. (Spring)

297 **Problems in Engineering Management** (3) Waters and Staff
Project course providing the opportunity to apply concepts and tools previously studied to the solution of an actual problem in engineering management. Students work in small groups, on a problem proposed by students and approved by the instructor. Open only to master's candidates in the department, preferably during the last year of their program. (Fall and spring)

298 **Research** (arr.) Staff
Basic or applied research in engineering management or systems engineering. Open to master's degree candidates in the department. May be repeated for credit. (Fall, spring, and summer)

299–300 **Thesis Research** (3–3) Staff

311 **Marketing of Technology II** (3) Stankosky and Staff
A systematic treatment of global marketing in the context of U.S. industrial competitiveness. Emphasis on understanding the global technical and marketing environment and formulating marketing strategies. Prerequisite: EMSE 294. (Spring, odd years)

312 **Managing the Protection of Information Assets and Systems** (3) Ryan and Staff
Advanced topics in protection of information assets and systems, including authentication, asset control, security models and kernels, physical security, personnel security, operational security, administrative security, security configuration management, and resource control. Prerequisite: EMSE 218. (Spring)

313 **Management of Cryptographic Systems** (3) Ryan and Staff
Use and management of symmetric and asymmetric cryptography, key management, public key infrastructures, certificates, and certificate authorities. (Spring)

314 **Auditing, Monitoring, and Intrusion Detection for Information Security Managers** (3) Ryan and Staff
Methods for detecting problems with unauthorized activity in information systems and management challenges associated with those activities. Prerequisite: EMSE 218. (Summer)

315 **Legal Issues for Information Security Managers** (3) Ryan and Staff
Legal issues regarding control of behavior in a connected enterprise. Sources of law and liability, specific laws and regulations governing Internet and on-line activities. Contracts, torts, business law, protection of intellectual property, and constitutional rights to privacy from the viewpoint of executives who rely on information infrastructures to manage modern enterprises. (Fall)

316 **Planning, Correction, and Restoration for Information Security Managers** (3) Ryan and Staff
Establishing and managing computer emergency response teams, handling information technology crises and emergencies, planning for business continuity, and recovering from IT emergencies. Prerequisite: EMSE 218. (Summer)

317 **Cybercrime for Information Security Managers** (3) Ryan and Staff
Criminal law and procedure pertaining to cyberspace. Legal responses to backing, cracking, phreaking, industrial espionage, and cyberterrorism. Transnational issues and constitutional rights. Prerequisite: EMSE 315. (Spring)

318 **Information Operations** (3) Ryan and Staff
Use and misuse of information and information technologies to advance causes, national interests, or cross-border special interests. Implications of information warfare for managers and policymakers. Prerequisite: EMSE 312 through 316. (Fall)

319 **Emerging Issues in Information Security** (3) Ryan and Staff
Exploration of emerging issues and rapidly evolving technologies in the field of information security. Prerequisite: EMSE 312 through 316. (Spring)

320 **Managing E-Commerce Technologies** (3) Jefferson and Staff
Principles of good e-business management. Methods of conducting e-commerce—major opportunities, limitations, issues, and risks. Popular technologies for building e-businesses, security authentication, privacy, acceptable use policies, and legal limits. (Fall, odd years)

321 **Data Communications and Networks** (3) Murphree and Staff
Technical and managerial aspects of data communications, with emphasis on communication networks. Methodologies used in data communications, communication networks, and distributed data processing. (Fall, odd years)

322 **A Strategic Approach to Information Systems** (3) Jefferson and Staff
Policies and guidelines that govern the arrangement of IT tools and data. Issues related to the establishment of a logical, coherent plan for decisions about technology investments and the support of tight coordination through a focus on system compatibility, interconnection, and integration. Prerequisite: EMSE 256 and 295. (Spring, even years)

332 **Disaster Recovery and Organizational Continuity** (3) Harrald and Staff
Disaster recovery planning and business continuity. Recovery of information and communication systems. The role of the private sector in mitigation and recovery. Public/private partnerships in community reconstruction and recovery. (Spring)

333 **Hazard Mitigation in Disaster Management** (3) Harrald and Staff
Hazard mitigation and its role in disaster management; analysis of past and current government and private-sector programs; examination of new approaches; structural versus nonstructural actions; mitigation of terrorist events. (Spring, odd years)

334 **Environmental Hazard Management** (3) Harrald and Staff
Geological, meteorological, radiological, chemical, and biological hazards facing the United States and international communities. Organizational responsibilities for hazard identification and management. Communication and perceptions of vulnerability and risk. Challenges to local governments and communities. (Spring)

344 **Construction Management Seminar** (3) Sarkani and Staff
Timely issues, recent research findings; guest speakers from the construction industry; in a seminar setting, students present results from individual research projects; applications of high technology in construction management; special emphasis given to productivity in construction. (Spring, even years)

351 **Advanced Topics in Mathematical Programming** (3) Abeledo and Staff
Fractional and geometric programming, branch-and-bound methods, max–min problems, Lagrangian algorithms, nonconvex optimization techniques. Prerequisite: EMSE 252 or permission of instructor. (Spring, odd years)

352 **Nonlinear Programming II** (3) Abeledo and Staff
Optimality conditions, convex analysis, development of families of unconstrained and constrained algorithms. Discussion of key results in mathematical programming, such as duality, rate of convergence, nonconvex programming, and sensitivity analysis. Prerequisite: EMSE 252 or permission of instructor. (Fall, odd years)

353 **Advanced Topics in Combinatorial Optimization** (3) Abeledo and Staff
Polyhedral theory. Integral polytopes. Use of polyhedral structure in the solution of integer programming problems. Strong valid inequalities for classes of integer programs. Lagrangian relaxation and decomposition methods. Prerequisite: EMSE 253 or permission of instructor. (Spring, even years)

370 **Knowledge Management II** (3) Stankosky and Staff
A capstone course. Students work in teams, applying principles and processes of systems thinking, systems engineering, and integrative management in the design and implementation of a knowledge management system. Prerequisite: EMSE 270, 272, 274, 275, 276. (Spring)

371 **Advanced Topics in Forecasting** (3) Mazzuchi and Staff
Dynamic linear models, Kalman filtering, non-Gaussian filtering, spectral analysis, simulation techniques and optimal control. Prerequisite: EMSE 271 or permission of instructor. (Spring, odd years)

373 **Design and Analysis of Simulation Experiments** (3) Frieder and Staff
Special topics from among perturbation and sensitivity analysis, initial transient problems and warm-up periods for nonterminating simulations, variance reduction techniques, response surface methods, developments in simulation software. Prerequisite: EMSE 273 or permission of instructor. (Fall, odd years)

377 **Advanced Stochastic Models in Operations Research** (3) Mazzuchi and Staff
Applied probability models, including the Poisson process, continuous-time, denumerable-state Markov processes, renewal theory, semi-Markov regenerative processes. Applications to queues, inventories, and other operations research systems. Prerequisite: EMSE 277 or permission of instructor. (Fall, even years)

381 **Reliability Theory II** (3) Mazzuchi and Staff
Mathematical theory: stochastic characterization of multivariate survival, shock models and wear processes, and reliability theory for multistate components. Statistical theory: recent developments in analysis of failure data. Prerequisite: EMSE 281. (Spring, even years)

386 **Advanced Topics in Management** (3) Waters and Staff
Readings and discussion of classical and recent literature concerning the philosophy and practice of management in technical organizations, including the impacts of changing technology, globalization, and insights from the social sciences. (Fall, odd years)

387 **Technological Forecasting and Management** (3) Stankosky and Staff
Concepts and methods for understanding the dynamics of technological change. Issues in technology assessment, technology transfer, and strategic management of technology. (Spring, even years)

388 **Quantitative Methods in Cost Engineering** (3) van Dorp and Staff
Fitting exponential growth curves using cost data for forecasting; multiperiod capital budgeting using the analytical hierarchy process and optimization; and

project network risk analysis. Case studies highlight theoretical complexities in solving problems. (Spring, odd years)

390 **Human–Computer Interaction** (3) Ryan and Staff
The human factors of interactive computing. Fundamentals of cognitive psychology, linguistics, computer science, and management science applied to the design and development of interactive computer systems: user modeling, requirements analysis, human–computer interface design, new systems implementation. (As needed)

391 **Project for Professional Degree** (3) Soland and Staff
Limited to students in the Applied Scientist or Engineer degree program. (Spring)

397 **Advanced Topics in Operations Research** (3) Mazzuchi and Staff
Advanced topics from the literature of operations research for analysis, presentation, and discussion. Reading assignments from professional journals selected by the instructor and the student. May be repeated for credit. Prerequisite: permission of instructor. (As arranged)

398 **Advanced Reading and Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

491 **Introduction to Knowledge and Innovation Management** (3) Halal, Stankosky
Same as Mgt 491.

493 **Knowledge and Innovation Management Technology** (3) Stankosky
The technologies that integrate people and organizational processes to form a knowledge and innovation management system. A notional framework is used to analyze organizational problems and opportunities, and to configure an integrated system solution encompassing leadership, management, organizational, learning, and technology elements. Prerequisite: EMSE/Mgt 491.

494 **Practicum in Knowledge and Innovation Management** (3) Stankosky, Halal
How the principles and processes of systems thinking, a systems approach, systems engineering, and integrative management can be used to design, implement, and manage a KIM system. Students gain insights into the fundamentals of applied systems thinking and experience in the use of these concepts as members of a project team. Prerequisite: EMSE 493. Same as Mgt 494.

ENGLISH

Professors R.N. Ganz, Jr., J.A.A. Plotz, C.W. Sten, D. McAleavey, O.A. Seavey, L.B. Salamon, A. Romines, J.A. Miller, J. Shore, F. Moskowitz (*Chair*), M.D. Clair, M. Alcorn, J.J. Cohen, J.G. Harris

Associate Professors R.L. Combs, G. Carter, K. Moreland, M.S. Soltan, D. Moshenberg, T.G. Wallace, J.M. Green-Lewis, P. Cook, P. Chu, G. Wald, V. Chandra, P. Griffith, E. Schreiber, M. Frawley

Assistant Professors R. McRuer, C.A. Leenerts, A.B. Levine, K. Daiya, J.C. James, M.D. Jones, S. Lovelady, S.P. Willens, F. Minwalla, S. Salchak

Adjunct Assistant Professors D. Scarboro, S. Maley, L. Raphael, M. Wallace

Adjunct Instructor S. Gold

Jenny McKean Moore Writer in Washington J. Hackett

Master of Arts in the field of English with optional concentrations in English or American literature—Prerequisite: a Bachelor of Arts degree with an undergraduate major in English or American literature, or 24 credit hours in English or American literature above the sophomore level.

Required: the general requirements stated under Columbian College of Arts and Sciences, including (1) 24 credit hours of course work planned in consultation with the department advisor; (2) Level One proficiency (translation of a passage with a dictionary) in an approved foreign language (French, German, Italian, Spanish, Greek, or Latin); (3) a Master's Comprehensive Examination in American or English literature, to be passed at the end of the course work; and (4) a master's thesis (6 credit hours) on an approved topic, directed by a member of the department's graduate faculty. Students must maintain a grade-point average of at least 3.25.

Doctor of Philosophy in the field of English with optional concentrations in English or American literature—Prerequisite: a Bachelor of Arts degree with an undergraduate major in English or American literature, or 24 credit hours in English or American literature above the sophomore level.

Required: the general requirements stated under Columbian College of Arts and Sciences, including satisfactory completion of (1) 60 credit hours of course work (36 for students with M.A. degrees in English) planned in consultation with the department advisor; (2) Level Two proficiency (translation of a passage without a dictionary) in an approved foreign language, or Level One proficiency (translation with a dictionary) in two approved foreign languages (French, German, Italian, Spanish, Greek, or Latin); (3) a qualifying examination in American literature or English literature, to be passed midway through the student's course work, and a field examination, to be passed by the end of the student's course work, topics and reading lists for which are to be designed in consultation with two graduate faculty advisors; (4) a dissertation proposal, which must be approved no later than one semester after completion of course work; and (5) a dissertation (12 credit hours) on an approved topic, directed by a member of the department's graduate faculty and completed by the end of the fifth year of study.

Each student plans a program of studies in consultation with the department advisor and a committee of the graduate faculty. Students must maintain a grade-point average of at least 3.5.

Note: All graduate English courses from Engl 205 forward may be repeated for credit with permission of the director of graduate studies.

201 **Introduction to Graduate Studies in English** (3) Romines, Wallace
Introduction to methodology for researching, writing, presenting, and publishing literary scholarship, to faculty and area resources, to current professional issues. Instruction in electronic research. (Fall)

202 **Teaching Writing** (3) Alcorn, McRuer, Moshenberg
Major texts and issues in contemporary composition theory and practical issues relating to writing classroom practice. Required of graduate teaching assistants and all other students who wish to teach in the writing program. (Fall)

203 **Introduction to Literary Theory** (3) Cohen, McRuer, Soltan, Wald
An overview of methodologies for examining texts as linguistic and cultural productions. Methodologies explored may include structuralism, formalism, deconstruction, cultural materialism, postcolonial theory, feminism, gender studies, and queer theory.

205 **Advanced Literary Theory** (3) Cohen, McRuer, Soltan, Wallace
The course focuses on a major figure or topic in theory (e.g., Foucault, Lacan, Barthes, Kristeva, Bakhtin, post-Marxist theory, language and power, the canon).

231–34 **Nineteenth Century** (3–3–3–3) Green-Lewis, Moreland, Plotz, Romines, Seavey, Sten, Wallace
Topics in British and American nineteenth-century writing and culture, exploring national traditions and international movements and issues, such as Romanticism, Realism, and others.

235–38 **Twentieth Century** (3–3–3–3) Chu, Green-Lewis, McAleavey, Miller, Moreland, Moshenberg, Romines, Soltan, Sten, Wald, James, Jones
Topics in twentieth-century British and American writing and culture, exploring national traditions and international movements and issues, such as literary modernism, anti-modernist and post-modernist currents, others.

240 **Writing Race and Nation** (3) Chu, Miller, Sten, Wald, Cohen, James, Jones
The course uses literary culture to explore intersections of origins and evolution of racial and ethnic identities and national myths and political objectives.

241 **Conceptualizing Genders** (3) Cohen, McRuer, Wald, Wallace
Structures of sex and gender difference considered historically and theoretically, including masculinity/femininity, sexualities, and their textual representations.

242–43 **Studies in Genre** (3–3) McAleavey, Sten, Daiya
Questions of genre, considered theoretically and practically. Content varies.

244 **Ethnicity and the Construction of Identity** (3) Chu, Sten
Literary culture is used to explore how individuals, communities, and societies construct self-awareness and knowledge about others for cultural exchange.

247 **Postcolonialism** (3) Plotz, Daiya
Postcolonial theory and texts by representative writers.

251 **Women and Writing** (3) Romines, Wald, Wallace
Selected topics in the traditions, theory, and texts of women's literary production and culture. Same as WStu 251.

261 **Selected Topics in Criticism** (3) Wald, McRuer
Topics may include cultural studies, film, gay/lesbian studies, others.

295 **Independent Research** (3) Staff
Written permission of instructor required. May be repeated for credit to a maximum of 9 hours.

299–300 **Thesis Research** (3–3) Staff

301–2 **Folger Institute Seminars** (3–3) Staff
Topics will be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs. Consult the graduate advisor before registration.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

ENVIRONMENTAL AND RESOURCE POLICY

Director H. Merchant

Master of Arts in the field of public policy with a concentration in environmental and resource policy—The program is affiliated with the School of Public Policy and Public Administration. Prerequisite: a bachelor's degree with a *B* average (or equivalent) in a social science, natural science, or other relevant area from an accredited college or university and an introductory course in statistics.

Required:

(a) The general requirements stated under Columbian College of Arts and Sciences.

(b) Twenty-eight hours of core courses selected from the following (students whose backgrounds include some of these courses may substitute additional courses in the elective field): BiSc 208, 243; Econ 217, 237; EnRP 210, 240; PSc 203; PAd 201; Stat 183 (or other appropriate statistical techniques course).

(c) Twelve credit hours chosen from designated courses within one of four elective fields—earth sciences, ecology, energy, and resource management. Courses are drawn from the Departments of Biological Sciences, Economics, and Geography and from the School of Engineering and Applied Science.

(d) Comprehensive Project—Undertaken at the completion of the student's program, the comprehensive project is the investigation of a specific problem in environmental and resource policy and the development of a proposed solution in a manner that integrates the core curriculum with the course work in the elective field.

210 **Seminar in Environmental and Resource Policy** (3) Merchant
Approaches to environmental decision making as related to the formation of environmental and resource policy. Emphasis on the development of a practical model to be used in the evaluation and incorporation of disparate information relevant to an environmental issue. Limited to degree candidates in the program or enrollment with permission of the instructor.

240 **Environmental Impact Statement Procedures and Environmental Law** (3) McGuirl
The rationale for environmental impact statements from the viewpoint of the nature and origins of environmental concerns. Government agencies responsible for environmental impact statements; current statutes and regulations pertaining to the environment.

EPIDEMIOLOGY

Columbian College of Arts and Sciences offers the degrees of Master of Science and Doctor of Philosophy in the field of epidemiology. The School of Public Health and Health Services collaborates with the Department of Statistics and the Biostatistics Center in these degree programs. For the Public Health courses listed below, please contact the School of Public Health and Health Services.

Master of Science in the field of epidemiology—Prerequisite: course work in multivariate calculus and matrix theory (Math 33 and 124) and proficiency in computer applications (Stat 183 or PubH 251). With approval of the academic director, applicants who lack some of the listed prerequisite course work may be admitted to degree candidacy and fulfill deficiencies during the first year of study; such course work does not count toward degree requirements.

Required: The general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 33 hours of course work, including Stat 157–58 and PubH 102, 201, 202, 240, 255, 280, 290, and 291. Two elective courses are chosen from either statistics or public health. A two-part Master's Comprehensive Examination is required.

Doctor of Philosophy in the field of epidemiology—Prerequisite: a master's degree in epidemiology or a closely related field, including the prerequisites listed under the Master of Science in the field of epidemiology. In some cases, an exceptionally well-prepared candidate may enter the program with a bachelor's degree.

Required: The general requirements stated under Columbian College of Arts and Sciences, including the required public health courses for the Master of Science in the field of epidemiology plus Stat 201–2, 210, 224, 225, and one course chosen from PubH 205 or another approved public health course. Electives are chosen from statistics and public health. At the end of the second year of study, a two-part General Examination is taken on biostatistics and epidemiology. A minimum of 12 hours of dissertation research is required; the dissertation must demonstrate the candidate's ability to do original research that develops methods or applications in the field of epidemiology.

295 **Reading and Research** (arr.)
May be repeated for credit.

299–300 **Thesis Research** (3–3)

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

EUROPEAN AND EURASIAN STUDIES

Program Committee: M.J. Sodaro (*Director*), H.L. Agnew, M. Atkin, H.B. Feigenbaum, J. Goldgeier, M. Gonglewski, H. Harrison, S.S. Rehman, R. Robin, P. Rollberg, R. Thornton, S. Wolchik, A. Zimmerman

Master of Arts in the field of European and Eurasian studies—The Elliott School of International Affairs offers a multidisciplinary program that provides a broad background in the history, politics, and economics of Europe and Eurasia (Russia and other parts of the former Soviet Union), as well as analytical tools for understanding the domestic and international dynamics of the entire region. The program is designed to provide skills-based professional training for those interested in government, business, and related careers in European and Eurasian affairs, with strong academic preparation for those planning further study.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a bachelor's degree in a related field.

Required: the general requirements stated under the Elliott School of International Affairs. The program consists of a minimum of 40 hours of course work. All students take a core field in European and Eurasian affairs consisting of five 3-credit courses, including at least one course each in three disciplines. Students take a second 9-credit field in a professional specialization. All students take Econ 280 or 283–84 and IAff 201 or 202, 213, and 295.

During the final 18 hours of the program, students must pass a language examination demonstrating oral and reading proficiency in a major European or Eurasian language. Those who pass exams in one language and wish to study a second European or Eurasian language may do so. Up to 6 hours of language study may be counted toward the 40 hours for the degree. Consult the program guidelines for further details.

Students who meet stated requirements may choose to take 34 hours of course work plus 6 hours of thesis research. See Thesis Option under the Elliott School section of this Bulletin.

EXECUTIVE MASTER OF BUSINESS ADMINISTRATION

The courses listed below are available only to degree candidates in the Executive Master of Business Administration program.

202 **Organization, Management, and Leadership** (3)
Integrates organizational concepts with management principles and theory applied to public and private organizations. Management thought, functions, and practices. Current management approaches and future challenges. Theories of managerial leadership, leadership issues, and problems in organizations at higher levels.

210 **Managerial Economics** (3)
Intermediate-level micro- and macroeconomic theory and its application in public and private-sector decision making. Demand, production, costs, investments, market structure and strategy, and market outcomes. Interpretation of economic conditions and theory and practice of monetary and fiscal policy. International economic and financial systems and trade theory.

212 **Business and Public Policy** (3)
The political, legal, economic, social, and ethical forces that act on business. Interaction of the market system and public policy process in the development of law and regulation, along with the evolving relationship of business and government in American society. Ethical judgments of corporate professionals, managers, and public officials.

214 **Fundamentals of Decision Science and Computational Methods** (3)
Theory and methods of business decision making, including intelligence, design, and choice. Useful approaches in cases of multiple objectives, compensatory and noncompensatory decision approaches, uncertainty and statistics, analytical models, and quantitative and qualitative measurement skills.

216 **Marketing Management** (3)
The marketing process from the firm's viewpoint. Market analysis, product planning, channels of distribution, pricing, and promotion. Approaches to financial, operational, and international market considerations. Analyzing market opportunities; researching and selecting target markets; marketing decision support systems; designing a marketing plan.

220 **Management of Operations and Manufacturing Strategy** (3)
Fundamentals of production and operations management and the associated tools and techniques used in decision making. Resource allocation, inventory management, and production planning and control. Technology-related developments, such as flexible manufacturing systems and computer integrated manufacturing.

221 **Strategic Management and Leadership** (3)
An introduction to the strategic management process with emphasis on implementation. Personal and organizational perspectives on the effective leader. Corporate executive leadership in a turbulent and competitive environment. (Fall)

222 **Financial Accounting** (3)
The role of accounting in the decision-making process of management and external parties. Interpretation of financial statements for the guidance of management. Interpretation and implementation of financial accounting.

224 **Theory and Concepts of Finance** (3)
Long-term financing and current operations, investment decisions, and dividend policy. Financial analysis, business theory, and policy and practice in financial management. The role of capital formation and the relationship of public policy and the structuring of interest rates.

226 **The Changing World Community: Implications for the Global Economy** (3)
The global competitive framework and how nations develop and sustain competitive advantage. The role of the multinational firm, the economic transformation of the Eastern European nations, and the internationalization of the Japanese economy with reference to the United States.

230 **Competitiveness and Corporate Innovation** (3)
Business, technological, economic, and political factors influencing the development of new products. Competitiveness and joint ventures, both locally and

globally, involving technological innovation and transfer. Enhancing organizational innovation, product concept development, technology marketing, and corporate venture divisions.

240 **International Business Strategy and Practice** (3)
The changing international environment and its impact on domestic and foreign multinational corporations. International finance, marketing, strategy, negotiations, and product policies. The economic, cultural, and political aspects that influence market conditions.

250 **Financial Decision Making in Firms and Markets** (3)
Decisions made by financial managers about working capital, fixed assets, and sources of financing in the context of world-wide business operations. Examines securities markets from the dual viewpoints of the company as a user of capital and investors as suppliers of capital. The relationship of risk and return and the value of securities.

254 **Managerial Accounting** (3)
The role of accounting in the management decision-making process. Costing systems, cost behavior analysis, responsibility accounting, and volume–profit relationships. Budgeting for financial planning and control; pricing and product mix decisions.

257 **Entrepreneurship and Creation of New Ventures** (3)
The process of innovation and entrepreneurship in the creation of new ventures. Access to venture capital; tax considerations; marketing new products and services. Approaches to managing small ventures, including technology-based ventures, and management for venture innovation in large and small organizations.

261 **Human Resource Management** (2)
Interpersonal and group dynamics in various organizational settings; direct managerial intervention in the process of organizational development. Issues and opportunities in managing outside one's own culture; executive selection and development; current personnel management practices and procedures.

262 **Information Systems in Management** (3)
A management-oriented survey of current and developing information technologies, including hardware, software, and systems development. The impact on management of the computing milieu. Information systems requirements and multimedia database approaches to handling data for business decision making.

263 **Executive Decision Support** (2)
Theory and methods of decision making in business and organizational situations. Judgmental forecasting, including statistical modeling, forward/backward planning process, conflict resolution, quality management, and value assessment. Use of computational tools, including spreadsheets, in forecasting.

264 **Marketing Strategy** (3)
Complex marketing problems involving policy and operational decisions. Marketing strategies in the perspective of environmental forces and business functions. The marketing research process. Marketing of intangibles and new and existing services, including service product decisions and planning.

266 **Advanced Topics** (2)
Problems in international finance, including the evolving international payments system and effective business practice regarding the international financial markets. International business strategies for the fast-growing economies of Southeast Asia, China, and Latin America. Strategic alliances, market entry, trade and investment, government relations, and business operations.

270 **Strategy Formulation and Implementation** (3)
Approaches to formulating strategies that enable organizations to adapt to changing social, technological, economic, and political conditions. Strategic management from the general manager's perspective; evaluation and control of strategy in various types of organizations.

FINANCE

Professors T.M. Barnhill, W. Handorf, M.S. Klock (*Chair*), S. Phillips, I.G. Bajeux-Besnainou, G.M. Jabbour, R.K. Green
Associate Professors J.M Sachlis, N.G. Cohen, P.S. Peyser, A.J. Wilson, P.R. Locke

Assistant Professors R. Savickas, K.L. Neuhauser, S. Agca, G. Jostova, A. Baptista
Professorial Lecturers S. Uyanik, J. Overdahl
Associate Professorial Lecturers R. Strand, T. McCormick

See the School of Business for programs of study in business administration leading to the degrees of Master of Accountancy, Master of Business Administration, Master of Science in Finance, and Doctor of Philosophy.

221 **Financial Decision Making** (3) Sachlis, Peyser, Klock, Wilson
Theory and practice of business finance, emphasizing the impacts of long- and short-term uses and sources of funds on the firm's market value. Prerequisite: MBAd 250. (Fall and spring)

222 **Capital Formation** (3) Handorf and Staff
Determinants of saving and investment and resultant funds flow are evaluated. Special emphasis on the level and risk structure and term structure of interest rates. The role and management of financial institutions is stressed. Prerequisite: MBAd 250. (Fall and spring)

223 **Investment Analysis and Portfolio Management** (3) Cohen, Klock, Bajeux-Besnainou, Baptista
Risk–reward analysis of security investments, including analysis of national economy, industry, company, and market; introduction to portfolio management; emphasis on theory and computer methods. Prerequisite: MBAd 250. (Fall and spring)

224 **Financial Management** (3) Barnhill, Cohen
Advanced case studies in domestic and international financial management; working capital policy, capital budgeting, financing with debt and equity, dividend policy, valuation, project finance, venture capital, and mergers and acquisitions. Prerequisite: Fina 221. (Fall and spring)

231 **Seminar: Investment and Portfolio Management** (3) Staff
Portfolio management theory, application, and computer modeling. Independent research on investment analysis and portfolio management with emphasis on theory, cases, and computer applications. Prerequisite: Fina 223. (Fall)

234 **New Venture Financing: Due Diligence and Valuation Issues** (3) Carayannis, Barnhill
Fundamentals and practice of due diligence and screening of early-stage investment opportunities. Same as Mgt 296.

235 **Futures Markets: Trading and Hedging** (3) Locke
Organization and regulation of futures markets. Alternative strategies for trading of futures contracts for possible hedging uses. High risk–high return investment alternatives. The use of futures markets to manage risks. Prerequisite: MBAd 250; recommended: Fina 221. (Fall and spring)

236 **Options** (3) Jabbour, Locke
Pricing of options on financial instruments. Role of options in risk management, trading strategies, hedging implications for national and international investors, financial engineering, and structure and regulation of option markets. Prerequisite: MBAd 250; recommended: Fina 221. (Fall and spring)

237 **Personal Financial Advising** (3) Cohen
For students preparing to be personal financial advisors; the combination of taxes, pensions, investing, budgets, estates and trusts, and insurance into comprehensive personal financial plans. Regulation, professional ethics, and the economics of advisory firms. Extensive use of computer spreadsheets and case studies. Prerequisite: Fina 223; Accy 261 is recommended. (Spring)

238 **Financial Engineering** (3) Barnhill
Valuation and risk management theory for bonds, forward contracts, swaps, options, exotic options, and interest rate options. Development of financial software, including Monte Carlo simulation modeling. Case studies of innovative solutions to investment, corporate finance, and financial institution management problems. Prerequisite: Fina 236. (Spring)

240 **Real Estate Development** (3) Staff
Examination of the forces that shape real estate development; market analysis methods and techniques to evaluate project feasibility; the institutional and legal framework within which real estate development occurs and that influences controls, land value, and development potential. (Fall)

241 **Financing Real Estate Development** (3) Green
Principles of real estate development finance; evaluating and measuring the investment attractiveness of real estate projects; obtaining, differentiating, and hedging sources of real estate funding; and appraising property. Incentives provided by local, state, and federal governments. Prerequisite: MBAd 250 or permission of instructor. (Fall and spring)

242 **Problems in Real Estate Valuation** (3) Staff
Applications of market analysis, valuation, and financial techniques to the real estate development process.

248 **Real Estate Development Cases** (3) Staff
Case study analysis of large-scale commercial real estate developments to gain comprehension of financial, political, legal, and technical complexities and constraints inherent in the real estate development process. Prerequisite: Fina 220 or permission of instructor.

Master of Science in Finance degree candidacy is prerequisite to Fina 271 to 282.

271 **Financial Modeling and Econometrics** (4) Soyer, Wirtz
Applied statistical and econometric analysis and modeling in finance. Methodologies include descriptive and inferential statistics, multivariate regression, time series analysis, and simulation modeling. Empirical studies are reviewed, and a series of research projects are undertaken. (Fall)

272 **Global Financial Markets** (4) Yang, Rehman
Theories explaining domestic and international interest rate and exchange rate structures. Roles of financial institutions and markets are investigated and forecasting methodologies are applied. (Spring)

273 **Advanced Accounting Applications for Finance** (4) Kumar, Neuhauser
Intermediate financial accounting; international and tax accounting. Emphasis on computer modeling to analyze and forecast a firm's financial statements to reflect possible future performance. (Fall)

274 **Corporate Financial Management and Modeling** (4) Sachlis, Handorf
The foundation theories of business real investment and financing are summarized and applied in a simulation environment. Emphasis on understanding the causal connections between business decision making in a global economy and the resulting valuation of the firm's financial assets. Financial modeling and forecasting applications. (Fall)

275 **Investment Analysis and Global Portfolio Management** (4) Jostova, Savickas
Financial markets and instruments viewed from the investor's perspective. Analysis of the value of equity and fixed-income securities and the construction of efficient portfolios in a global financial market. Issues of market efficiency, tax structures, and investment funds; computer-based models. (Spring)

276 **Financial Engineering and Derivative Securities** (4) Jabbour, Seale
Mathematical and theoretical foundations to value-derivative securities, including options, futures, and swaps; hedging and trading applications of these contracts. Arbitrage trading across cash and derivative markets and its role in maintaining equilibrium prices. (Summer)

277 **Comparative Financial Market Regulation and Development** (4) Gabaldon
Theory and current status of comparative regulation of domestic and international financial institutions and markets. Effects on country economic development and international trade. (Fall)

278 **Financial Theory and Research** (4) Peyser, Bajeux-Besnainou
Theoretical constructs of business investment and financing decisions and of financial asset pricing structures in domestic and international environments. Analytical and numerical models are developed, and empirical studies are evaluated. (Spring)

279 **Real Estate Finance and Fixed-Income Security Valuation** (4) Green, Agca
A primary focus is the application of financial theory to real estate investment and financing. Another is fixed-income security valuation and design and portfolio management. Application of decision support and artificial intelligence systems in making financial decisions. (Spring)

280 **Financial Institution Management and Modeling** (4) Handorf
Financial institution asset and liability management. A dynamic simulation model is developed and run under varying macroeconomic conditions, as additional layers of complexity, involving multinational investment, borrowing, and hedging, are added. (Summer)

281 **Cases in Financial Management and Investment Banking** (4) Cohen, Jabbour
Through a series of cases and simulations, students address real financial problems faced by domestic and international companies, including capital budgeting, capital structure, mergers and acquisitions, and project financing. The negotiating process by which many financial situations are resolved is emphasized. (Summer)

282 **Directed Research in Finance** (1 to 4) Jabbour, Joutz, Click
Students design and execute a financial research study, applying knowledge developed throughout the M.S. in Finance program. Class sessions vary from lectures on research methods to colloquia by outside professionals to critique studies. (Summer)

290 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

298 **Directed Readings and Research** (2 to 4) Staff

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

321 **Seminar: Financial Markets Research** (3) Klock
Market efficiency, utility testing, the capital asset pricing model, the arbitrage pricing theory, the option pricing model, and aggregate market volatility.

322 **Seminar: Corporate Finance Research** (3) Neuhauser
Capital budgeting, capital structure issues, dividend policy, microeconomic foundations, mergers, and agency theory.

323 **Seminar: Continuous-Time Finance** (3) Bajeux-Besnainou, Savickas
Review of the stochastic calculus methods needed for continuous-time pricing models. The most important continuous-time models, including pricing of derivative securities, consumption-portfolio selection models, continuous-time capital asset pricing models, consumption-based capital asset pricing models, continuous-time arbitrage pricing theory, and different yield curve models.

324 **Seminar: Financial Markets and Institutions** (3) Staff
Multi-period asset pricing, term structure of interest rates, market imperfections and institutional factors, auctions, manipulation, derivative markets, market microstructure, and financial institutions.

397 **Doctoral Seminar** (1 to 3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

FINE ARTS AND ART HISTORY

Professors L.F. Robinson, J.F. Wright, Jr., T. Ozdogan, M.P. Lader, J.C. Anderson (*Chair*), B. von Barghahn, D. Bjelajac
Associate Professors J.L. Stephanic, K.J. Hartswick, P. Jacks
Assistant Professors T. Brown, C. Spangler, E. Speck, D. Kessmann
Associate Professorial Lecturer L.D. Miller

Master of Arts in the field of art history—Prerequisite: a Bachelor of Arts degree with a major in art history from this University, or an equivalent degree.

Required: the general requirements stated under Columbian College of Arts and Sciences; 33 credit hours, including 6 hours of thesis research. As many as possible of the 27 credit hours of course work should be in 200-level courses; the 6 hours of electives may be taken in museum-related courses. Students are required to take a seminar in each of the following areas: art historiography, classical, medieval, Renaissance, Baroque, modern, and American. The art historiography seminar (taught under AH 261) must be taken during the first semester of course work. A reading knowledge examination in German or French must be passed before completion of the first 9 credit hours of course work. A Master's Comprehensive Examination must be passed before students can enroll for the 6 credit hours of thesis research. A written thesis must be submitted to and approved by the faculty.

Master of Arts in the field of art history with a concentration in museum training—Required: the general requirements stated under Columbian College of Arts and Sciences; 33 credit hours, including 6 hours of internship credit. As many as possible of the 27 hours of course work should be in 200-level courses. Students are required to take a seminar in each of the following areas: art historiography, classical, medieval, Renaissance, Baroque, modern, and American. Six hours of electives in art history or in museum-related courses are selected in consultation with the graduate advisor. A reading knowledge examination in German or French must be passed before completion of the first 9 credit hours of course work. Students are required to pass the Master's Comprehensive Examination in art history.

Satisfactory completion of 12 credit hours of graduate art history courses is required before internships may begin. Internships may be applied for at any number of museums and galleries including the Corcoran Gallery of Art, Hirshhorn Museum and Sculpture Garden, Museum of African Art, National Museum of American Art, National Museum of Women in the Arts, Phillips Collection, Renwick Gallery, and Textile Museum.

Programs specific to museum studies and museum education are also available.

Master of Fine Arts in the field of ceramics, design, interior design, painting, or photography—Prerequisite: a bachelor's degree with a major in fine arts in the field of ceramics, design, interior design, painting, or photography. For the field of interior design, a minimum of 6 credit hours each in fine arts and in art history is prerequisite. For all other fields, departmental approval of the applicant's work is required. This should consist of slide examples of work in the area of application as well as slides of representative works in other areas. Applicants to the photography program should submit photographic works only. Students planning to do graduate work in painting must have completed 12 credit hours of drawing at the undergraduate level before admittance to the master's program.

Required: the general requirements stated under Columbian College of Arts and Sciences. A minimum of 45 credit hours of course work is required; the number of required hours and their distribution are determined in consultation with advisors. As much as possible of the course work should be in 200-level courses. For interior design as a first professional degree, 39 credit hours are in required courses (including the two courses taken concurrently at the end of the program), and a minimum of 6 hours are in elective courses.

Except for interior design, a creative thesis consisting of the execution of original works of art in ceramics, design, painting, or photography will be completed under the supervision of a thesis advisor. In addition, the thesis must include a written statement and analysis of artistic purpose, subject to the approval of the thesis advisor and a second faculty reader. A representative portion of the work illustrating the creative thesis may be retained by the University at the discretion of the thesis director in agreement with the second reader.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

ART HISTORY

220 **Seminar: Baroque Art of the 17th Century** (3) von Barghahn
A reading knowledge of Italian is desirable for the Italian area and German for the northern area. Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

221 **Seminar: Renaissance Art** (3) von Barghahn, Jacks
A reading knowledge of French, German, or Italian is desirable, depending on the specific area. Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

232 **Museum Preventive Conservation I** (3) Staff
Same as Anth 232.

233 **Museum Preventive Conservation II** (3) Staff
Same as Anth 233.

243 **Seminar: American Art** (3) Bjelajac
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

244 **Seminar: 19th-Century European Art** (3) Robinson
Reading knowledge of French desirable. Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

245 **Seminar: 20th-Century European Art** (3) Lader
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

246 **Seminar: Classical Art** (3) Hartswick
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

247 **Proseminar: Medieval Art and Archaeology** (3) Anderson
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

248 **Independent Research in Art History** (3) Staff

261 **Seminar: Problems in Art History** (3) Staff
Topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

285 **Museum Internship** (3 to 12) Staff
Open only to candidates for the degree of Master of Arts in the field of art history with a concentration in museum training.

289–90 **Thesis Research** (3–3) Staff

FINE ARTS

Note: All fine arts courses may be repeated for credit with approval of the department. Schedule of fees for FA 248 and 299–300: Ceramics—$105; 2-D Design—$24; 3-D Design—$27; Drawing—$75; Printmaking—$54; Sculpture—$85; Typography—$75; Oil and Acrylic Painting—none; Watercolor—$45; Photography—$100; Visual Communication—$100; Interior Design—$100 (FA 248 only); Lithography—$54; Serigraphy—$75; Jewelry Design—$85.

201 **Foundations in Interior Design Theory** (3) Staff
Theory and topics in design. Application of design principles and elements to specific studies of the built environment. Examination of relationships among creative, social, and technical dimensions of interior design.

202 **Graphics for Interior Design** (3) Staff
Basic graphic communication skills appropriate for the development of design projects and study exercises. Two- and three-dimensional drawing skills developed through sketching, orthographic drawing, paraline drawing, and pictorial perspective. Use of equipment and material required for technical drawing. Laboratory fee, $100.

203 **Computer-Aided Drafting for Interiors** (3) Staff
Introduction to CAD technology, two- and three-dimensional drawings, plotting and enhancement of presentations. Use of CAD to speed and enhance the design process. Prerequisite: FA 193. Laboratory fee, $100.

204 **Textiles and Finish Materials** (3) Staff
Textile fiber content, physical characteristics, construction techniques, dyes, printing, and finishing. Standards, testing, specification, and application of textile products. Properties, specification, and installation of interior finish materials. A comprehensive textile notebook, fabric and finish presentation boards, a research paper, and class presentation are required. Laboratory fee, $100.

205 **Advanced Photography: Exposure and Printing Techniques** (3) Staff
Tone control through exposure tests. Development of portfolio utilizing approved theme and established exposure and development times. Prerequisite: FA 23 and 24. Laboratory fee, $100.

206 **Advanced Photography: Digital Color Printing** (3) Staff
Printing from digital files. Scanning color transparency and negative film. Correct color balancing and creative color shifts. Development of portfolio on approved theme. Prerequisite: FA 23 and 24. Laboratory fee, $100.

208 **Advanced Photography: Special Projects** (4) Staff
Independent projects requiring approval prior to registration. Prerequisite: FA 181 and 182, or permission of instructor. Laboratory fee, $100. (Fall and spring)

209 **Exhibition and Display Design** (3) Miller

220 **Lighting Design** (3) Staff
Terminology, concepts, and principles of lighting design. Light and energy, incandescent and gaseous discharge lamps, luminaries, task requirements, mea-

surement and calculations, human factors, and design applications for lighting. Development of case studies highlighting successful lighting design installations. Prerequisite: FA 202. Laboratory fee, $100.

221 **Graduate Interior Design Studio I** (3) Staff
Application of basic design concepts and processes to residential design. Human factors and development of space planning skills in single and multifamily spaces. Selection of furniture, fabric, and finishes. Design and custom millwork and window treatments. Introduction to research and documentation. Prerequisite: FA 202 and 204. Laboratory fee, $100.

224 **Advanced Ceramic Sculpture** (3) Ozdogan
Continuation of Art 152 with emphasis on individual approach. Exploration of mixed media and mold casting. Laboratory fee, $105. (Fall)

225 **Industrial Ceramics/Model and Mold Making/ Functional Forms** (3) Ozdogan
Production processes from model making to finished duplicate form as it exists on factory level. All aspects of model designing and making in clay and plaster; plaster lathe carving with wheel applications; mold making in plaster; production methods from molds (press molding, slip casting, jiggering and jollying, and ram pressing). Laboratory fee, $105. (Fall and spring)

226 **Architectural Ceramics** (3) Ozdogan
Advanced studies in ceramic murals and sculptures designed for indoor and outdoor architectural concepts. Laboratory tests and activities. Laboratory fee, $105. (Spring)

235 **Design V: Textile Printing** (3) Staff
Designing and executing textiles using the techniques of silk screen, block print, and batik. Laboratory fee, $24. (Fall and spring)

243 **Graduate Interior Design Studio II** (3) Staff
Nonresidential spaces: commercial, industrial, hospitality, and institutional. Intensive analysis and space planning of nonresidential interiors with emphasis on technology, codes, and environment and behavior concepts. Prerequisite: FA 221. Laboratory fee, $100.

244 **Advanced Drafting and Materials** (3) Staff
Structural building systems, methods and materials of construction, and standard graphic representation. Organization and preparation of construction documents, finish and material and interior component schedules, and detailing. Prerequisite: FA 221. Laboratory fee, $100.

245 **Advanced Interior Design Studio** (3) Staff
Multifaceted and complex problems in residential and nonresidential design. Further exploration of design theory, practical application and guidelines, and development of advanced studio work. Prerequisite: FA 243. Laboratory fee, $100.

246 **Furniture Design** (3) Staff
Major 20th-century furniture designers and the environments in which the furniture was used. Study and design of furniture that combines functional and aesthetic quality. Use of two- and three-dimensional drawings and models to develop design and technical skills. Laboratory fee, $100.

247 **Design of Printed Textiles** (3) Staff
Surface pattern design of textiles. Source materials, design techniques, and industry practices. Development of technical skills required for preparation of portfolio design pieces on paper and with electronic tools. Prerequisite: FA 201 or permission of instructor. Laboratory fee, $100.

248 **Independent Research in Fine Arts** (1 to 6) Staff
For master's degree candidates; open to limited number of qualified undergraduates, with permission. Independent research arranged in consultation with individual instructor and graduate advisor. May be repeated for credit. Laboratory fee depending on area chosen. (Fall and spring)

249 **Theory and Practice** (3) Staff
Stimulation and articulation of personal creativity and critical and presentational skills. Emphasis on visual diaries, problems of individual artistic production, and peer interaction on issues in contemporary art and design. Recommended for graduate students in all areas before the thesis and for senior majors with permission of instructor. Laboratory fee, $24.

250 **Design and Construction of Woven Textiles** (3) Staff
Design and construction of various types of woven textiles. Independent research on historic sources and techniques. The creative process and design development. Prerequisite: FA 201 or permission of instructor. Laboratory fee, $100.

251 **Advanced Ceramic Design in Wheel Throwing** (3) Ozdogan
Individual projects on the potter's wheel. Student establishes personal style and direction and perfects skills. Either pottery or sculptural approaches encouraged. Research in clays, glazes, and firings is required. Laboratory fee, $105. (Fall and spring)

252 **Mosaic Design Applications** (3) Ozdogan
Advanced study and execution of ceramic murals and sculpture for indoor and outdoor architectural spaces. Extensive student technical research, including special cutting techniques, laboratory tests of clay glazes, and firings. Laboratory fee, $105. (Fall and spring)

253 **Industrial Ceramic Design/Mold Making** (3) Ozdogan
Architectural and sculptural forms. The multiple production process from model making to finished duplicate form as it exists on factory level. All aspects of model designing and making in clay and plaster; mold making in plaster; production methods from molds including press molding and slip casting. Laboratory fee, $105. (Fall and spring)

254 **Advanced Ceramic Technology** (3) Staff
A thorough investigation of specific ceramic materials, clay bodies, and glazes, with an emphasis on calculation and formulation, alteration, and firing. Prerequisite: Art 151 or approval of instructor. Laboratory fee, $105.

265–66 **Painting IV** (3–3) Woodward
Alternatives in pictorial dynamics. Assigned studio and independent problems in alla prima and mixed techniques. Material and model fee, $45 per semester. (Academic year)

267–68 **Individual Problems in Photography** (4–4) Staff
Limited to M.F.A. candidates and qualified undergraduates. Prerequisite: Permission of instructor and approval of project prior to registration. May be repeated for credit. Laboratory fee, $100 per semester. (Academic year)

275 **Painting V** (3) Woodward
Development of personal imagery. Individual problems and critiques. Material and model fee, $45.

277 **Advanced Visual Communication: Packaging Design and Illustration** (3) Staff
Advanced studio projects. May be repeated for credit provided the content differs. Laboratory fee, $100. (Fall and spring)

278 **Advanced Visual Communication: Problem Solving and Applied Design** (3) Staff
Advanced studio projects. May be repeated for credit provided the content differs. Laboratory fee, $100. (Fall and spring)

279–80 **Sculpture IV** (3–3) Staff
Advanced study aimed at development of concept and style. Prerequisite: permission of instructor. Laboratory fee, $85 per semester. (Academic year)

281 **Sculpture V** (3) Staff
Emphasis on individual sculptural concepts and materials. Prerequisite: permission of instructor. Laboratory fee, $85. (Fall and spring)

284 **Studio in Historic Interiors** (3) Staff
Exploration and interpretation of significant periods of interior design through the study of historic furniture, decorative art, and architecture. Application of historic styles for restoration or adaptive use in interior environment. Prerequisite: AH 169 and 170. Laboratory fee, $100.

285 **Environmental Analysis in Interior Design** (3) Staff
Evaluation of interior spaces for effectiveness and coherence. The effect of the built environment on human behavior. Factors that contribute to functional and dysfunctional design for interiors.

289 **Presentation Techniques** (3) Staff
Development of multimedia techniques in rendering. Advanced three-dimensional drawing using rapid visualization techniques, sketching, and constructed drawings. Laboratory fee, $100.

290 **Interior Design Practicum** (3) Staff
Students work with professional interior designers, architects, or industry-related professionals, participating in implementation of information and skills in project-based setting. Roles and responsibilities of the professional interior designer: business procedures, legal implications, ethics, trade relations, designer–client–contractor relations. Prerequisite: FA 243.

292 **Seminar in Interior Design** (3) Staff
Application of advanced topics in design theory; research methodology applied to development of the graduate project. Prerequisite: completion of all other program requirements; taken concurrently with FA 293.

293 **Graduate Project in Interior Design** (3) Staff
Application of design skills and knowledge to student-selected project. Emphasis on individual development of the design process, problem-solving skills, and evaluation and defense of the project. Prerequisite: completion of all other program requirements; taken concurrently with FA 292. Laboratory fee, $100.

299–300 **Thesis Research** (3–3) Staff
Laboratory fee depending on area chosen.

FORENSIC SCIENCES

Professors J.E. Starrs, W.F. Rowe, M.S. Schanfield (*Chair*), E.A. Vincze
Associate Professor N.T. Lappas
Assistant Professor E.M. Robinson
Professorial Lecturers M.M. Christian, J.G. Jackson, H. Deadman, M. Heaney
Associate Professorial Lecturer S.R. Lorigo
Assistant Professorial Lecturers W.E. Clancy, D.A. Pluchinsky, D.C. Mount, D.I. Salem, M.J. Bonanno, G.D. Hackney, J.E. Miller, B. Pearson, J. Trump

Master of Forensic Sciences—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 36 credit hours, including ForS 211, 212, 221, 222 or 223; 9 credits selected from ForS 201, 202, 203, 204, 206, 207, 208; 9 credits selected from ForS 234, 236, 254, and 256; 6 elective credits chosen in consultation with the departmental advisor; and successful completion of a Master's Comprehensive Examination.

Master of Forensic Sciences with a concentration in crime scene investigation—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 36 credit hours, including ForS 212, 221, 223, 251, 252, 253, 256, 257; 12 elective credits chosen in consultation with the departmental advisor; and successful completion of a Master's Comprehensive Examination.

Master of Forensic Sciences with a concentration in forensic chemistry—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 36 credit hours, including ForS 206, 211, 221, 223, 234, 235, 238, 239; 12 elective credits chosen in consultation with the departmental advisor; and successful completion of a Master's Comprehensive Examination.

Master of Forensic Sciences with a concentration in forensic toxicology—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 36 credit hours, including ForS 211, 212, 221, 223, 231, 232, 234, 235, 236, 237; 6 elective credits chosen in consultation with the departmental advisor; and successful completion of a Master's Comprehensive Examination.

Master of Forensic Sciences with a concentration in forensic molecular biology—Required: the general requirements stated under Columbian College of Arts and Sciences. Prerequisite: a bachelor's degree from an accredited college or university with a major in biological sciences. The program consists of 36 credit hours, including ForS 201, 211, 221, 223, 228, 241, and 242; 15 elective credits chosen in consultation with the departmental advisor; and successful completion of a Master's Comprehensive Examination.

Master of Forensic Sciences with a concentration in high-technology crime investigation—Required: the general requirements stated under Columbian College of Arts and Sciences. Prerequisite: ForS 115, 116, 117, 118, and 119, or equivalents. The program of study consists of 36 credit hours, including ForS 259, 261, 262, 264, 265, 273, 277, 279, and 285, plus 9 credits of electives chosen from ForS 268, 269, 271, 274, 278, 280, 281, 282, 283, 290, 295, 298.

Master of Forensic Sciences with a concentration in security management—Required: the general requirements stated under Columbian College of Arts and Sciences. Prerequisite: ForS 115, 116, 117, 118, and 119, or equivalents. The program of study consists of 36 credit hours, including ForS 260, 261, 262, 264, 265, 266, 267, 273, and 284, plus 9 credits of electives chosen from ForS 263, 268, 269, 270, 271, 286, 290, 295, and 298.

Note: ForS 115–119 are available only to students conditionally admitted to programs offered by the Department of Forensic Sciences; credit does not apply to any degree programs at GW. ForS 115–119 and 259–286 are offered off campus only.

115 **Introduction to Criminal Investigations** (3)
Legal aspects of search and seizure; crime scene documentation techniques; fingerprint processing methods; collecting impression evidence; locating and enhancing blood and body fluids; blood spatter pattern analysis.

116 **Introduction to Criminal Law** (3)
Principles of criminal law and procedure, preparation and presentation of evidence, examination of witnesses, and methods of legal research.

117 **Introduction to Organizational Systems for Security Professionals** (3)
Fundamentals of management processes in organizations, with emphasis on accounting practice. Organizational structures, strategic planning, information systems, and human resource functions.

118 **Introduction to Computer Systems for Security Professionals** (3)
Aspects of computer systems and software that directly relate to media analysis, i.e., storage, memory, the structure of file systems, and system peripherals that may contain evidence. Laboratory fee, $50.

119 **Introduction to Network Systems for Security Professionals** (3)
Aspects of network tools, administrative tools, network protocols, and fundamentals of TCP/IP that can be used to carry out a network-based attack. Development of a working knowledge of how information is processed and can be intercepted on the Internet/Intranet. Laboratory fee, $50.

201 **Forensic Biology** (3)
Principles of the forensic analysis of blood and other biological materials. Specific procedures and techniques used in forensic biology and serology. Laboratory fee, $50.

202 **Instrumental Analysis** (3)
Principles and application of various instrumental methods to the examination of physical evidence, including chromatographic and spectroscopic techniques and mass spectrometry. Laboratory fee, $50.

203 **Examination of Questioned Documents** (3)
Theory and principles of handwriting and handprinting, duplicating processes, paper manufacture and fiber analysis; studies of paper and methods of examining questioned documents. Laboratory fee, $50.

204 **Firearms and Toolmark Identification** (3)
Methods for identifying firearms, bullet cartridge casings, toolmarks, gunshot residue, obliterated serial numbers, tire marks, and footprints. Laboratory fee, $50.

206 **Trace Evidence Analysis** (3)
Principles that govern the analysis of trace evidence, including recovery, transference, interpretation, and comparison. Assessment of evidentiary value, reporting, and court testimony. Laboratory fee, $50.

207 **Photography in the Forensic Sciences** (3)
Basic use of forensic photography, including selection and use of equipment, photographs as evidence, close-up work, and common misconceptions. Laboratory fee, $50.

208 **Terrorism** (3)
An analytic framework for the interpretation of concepts, goals, strategies, and targeting of international terrorist groups. The evolution of international and U.S. counterterrorism strategies.

211 **Physical Aspects of Forensic Sciences** (3)
Survey of forensic physical sciences; fingerprints, firearm and toolmark examinations, document examinations, and examinations of trace evidence, such as glass, soil, paint, hairs, and fibers; crime scene investigations; qualifications and preparation of expert witnesses; operation and functioning of the forensic science laboratory. Laboratory fee, $50.

212 **Biological Aspects of Forensic Sciences** (3)
Principles of forensic serology, molecular biology, population biology, wildlife biology, entomology, anthropologic pathology, and toxicology. The role of the forensic laboratory in the identification of human remains; determination of the time, cause, and manner of death. This course cannot be taken for credit toward the forensic molecular biology concentration. Laboratory fee, $50.

221 **Criminal Law I** (3)
Principles of criminal law and procedure, preparation and presentation of evidence, examination of witnesses, and methods of legal research.

222 **Criminal Law II: Evidence** (3)
Procedural rules affecting the collection and use of physical evidence. Emphasis on court opinions defining the rules of search and seizure and admissibility of evidence. Prerequisite: ForS 221.

223 **Criminal Law III: Moot Court** (3)
Students prepare and present direct testimony and are cross-examined by an experienced trial attorney in simulated courtroom setting. Class discussions of problems, techniques. Lectures on discovery, admissibility of scientific evidence, chain of custody, use of notes, etc. Prerequisite: ForS 221.

228 **Population Genetics** (3)
Same as BiSc 228.

231 **Principles of Toxicology** (3)
Concepts of toxicology, including its historical development and modern applications, drug disposition, mechanisms of toxicity; factors that influence toxicity and toxicity evaluation.

232 **Analytical Toxicology** (3)
Qualitative and quantitative principles and procedures used in the detection, identification, isolation, purification, and potency determination of drugs.

234 **Medicinal Chemistry I** (3)
Chemical, pharmacological, toxicological, and pathological characteristics of commonly abused drugs, including ethanol, barbiturates, narcotics, stimulants, and hallucinogens.

235 **Medicinal Chemistry II** (3)
Theory and principles of classification, synthesis, and structure activity relationships of drugs. Discussion of the complex chemical events that take place between administration of a drug and its action on the user, with emphasis on drugs of abuse.

236 **Forensic Toxicology I** (3)
Biological, chemical, and pharmacological principles that underlie forensic toxicology. Prerequisite: ForS 235 or permission of instructor.

237 **Forensic Toxicology II** (3)
Lectures, student seminars, and projects dealing with topics of current interest in forensic toxicology. Prerequisite: ForS 236 or permission of instructor.

238 **Forensic Chemistry I** (3)
Examination of glass and soils. Laboratory exercises include refractive index measurements using immersion methods; polarized light observations of minerals; x-ray diffraction analysis of minerals; and classical chemical and physical methods of analysis. Prerequisite: ForS 202 or permission of instructor. Laboratory fee, $50.

239 **Forensic Chemistry II** (3)
Examination of arson accelerants, textile fibers, plastics, and paints. Laboratory exercises include infrared spectrometry and pyrolysis–gas–liquid chromatography of polymeric materials, as well as classical chemical and physical methods of analysis. Prerequisite: ForS 238 or permission of instructor. Laboratory fee, $50.

241 **Forensic DNA Profiling** (3)
Techniques of molecular biology applied to the collection, examination, analysis, and interpretation of biological evidence.

242 **Forensic Molecular Biology** (3)
Advanced methods of forensic molecular biology. Laboratory examinations and classifications of dried blood and other biological materials through a variety of nuclear and mitochondrial markers. Laboratory fee, $50. Prerequisite: ForS 241 and permission of instructor.

250 **Crime Scene Investigation for Lab Personnel** (3)
A condensed offering of the subject matter of ForS 251–52. ForS 250 cannot be taken for credit toward the crime scene investigation concentration. Laboratory fee, $50.

251–52 **Crime Scene Investigation I–II** (3–3)
Examination, analysis, and reconstruction of crime scenes. Principles from biology, chemistry, and physics applied to identification, documentation, preservation, and collection of physical evidence. Laboratory fee, $50 per semester. ForS 251 is prerequisite to ForS 252.

253 **Homicide Investigation** (3)
How an examination of the suspect–victim exchange can lead to an understanding of the offender's motivations. How examination of the forensic evidence can lead not only to the suspect's motives but also to the suspect.

254 **Forensic Psychiatry** (3)
Introduction to the constructs of dynamic psychiatry, psychiatric treatment, and the nomenclature of mental disorders. Consideration of expert testimony, direct examination, and cross-examination in hospitalization and criminal cases.

255 **Investigation of Child Abuse** (3)
This course integrates medical, scientific, psychological, sociological and legal information for investigators and professionals involved in the field of child abuse. Special emphasis will be placed on the application of research-supported data to situations involving the murder, abuse and exploitation of children.

256 **Forensic Pathology** (3)
Terminology and scientific techniques used in medico-legal investigations, sudden or unexpected deaths, homicides, suicides, accidental deaths, and trauma.

257 **Medicolegal Death Investigation** (3)
Medical, scientific, sociological, and legal methodologies applied to forensic investigations. Aspects of death scene analysis by a medical examiner, including autopsy procedures, unidentified remains, child death investigations, and mass disaster investigations.

259 **Computer-Related Law** (3)
A problem-oriented course that focuses on applying the holdings of cases and analysis of statutes to different criminal fact patterns. The course is designed to examine criminal law, criminal procedures, and evidence as it relates to computer crime and the collection/analysis of digital evidence. Open only to students enrolled in off-campus forensic sciences programs.

260 **Security Case Law** (3)
Negligence and liability, international torts, compensatory and punitive damages, and contract law. The exercise of security functions by private individuals and organizations.

261 **Security Management** (3)
An overview of the factors that shape modern security management: technology, law, ethics and societal changes. The course focuses on risk assessment and the necessity to identify, analyze, and counter threat.

262 **Risk Analysis and Loss Prevention** (3)
An overview of the risk analysis process: how security threats and vulnerabilities are identified and quantified; how controls and countermeasures are evaluated and prioritized. Principles of loss prevention and the protection of assets.

263 **Issues in Crisis and Disaster Management for Security Professionals** (3)
Theoretical and practical considerations that surround a specific crisis or disaster situation. Practical approaches for securing assets vulnerable to these threats. Situational exercises. Open only to students enrolled in off-campus forensic sciences programs or by approval of the program director.

264 **Protection of Information Systems** (3)
An overview of the types of information assets that need protection from loss. Basic techniques covered include: effective protection of automated information, including backup, disaster management, and intrusion detection.

265 **Ethics and Leadership** (3)
The ethical dimensions of business issues faced by security professionals: employer/employee relations, loyalty, privacy, the professional use of technology, and ethics in a global environment.

266 **Emergency Planning and Business Continuity** (3)
Approaches used to develop effective plans for managing emergency situations and ensuring business continuity when disasters occur.

267 **Organizational Behavior for Security Professionals** (3)
Basic concepts of individual, group, and organizational behavior. Specific management and leadership models and approaches to workplace crime problems. Case studies in a variety of organizational settings.

268 **Industrial Espionage and Corporate Privacy Issues** (3)
Countermeasures to protect intellectual capital and physical asset from competitors. Methods used to collect information on businesses and to neutralize threats to corporations and government. The role of the security professional in protecting individual privacy and sensitive and/or proprietary information within organizations. Open to departmental degree candidates only.

269 **Corporate Fraud** (3)
Common types of corporate fraud and internal controls to prevent and/or detect fraud. Elements of corporate conspiracy.

270 **Security Contracting with Federal and State Entities** (3)
Federal and state procurement practices from the viewpoint of a prospective security service provider.

271 **Forensic Psychology** (3)
Application of principles of psychology in civil and criminal proceedings: determining criminal responsibility, competence to stand trial, and testamentary capacity; jury selection.

273 **Research Methods for Security Professionals** (3)
Identifying research resources; critical analysis vs. descriptive reports; applying appropriate measurement instruments, quantitative and qualitative research methods; written and oral presentation skills. Students develop and present a professional research report or a response to a request for research proposal.

274 **Video Forensic Analysis** (3)
Examines the principles of digital forensic analysis applied to Forensic Investigation and how to use these technologies to identify fraudulent and criminal activities. Open to departmental degree candidates only.

277 **Computer Forensics I: Investigation and Data Gathering** (3)
Techniques used to detect computer crime and gather probative evidence to secure conviction under federal law. Open only to students enrolled in the department or by approval of the program director. Laboratory fee, $50.

278 **Computer Forensics II: Evidence and Analysis** (3)
Threats to, and vulnerabilities of, computer systems and how to minimize them. Open only to students enrolled in the department or by approval of the program director. Laboratory fee, $50.

279 **Intrusion I: Understanding and Identifying Network-Based Attacks** (3)
Computer network operations and network-based computer crime. Fraud schemes related to electronic commerce, theft of sensitive computer information, compromise of computer networks, and identity theft. Elements of proof of network-based crime are discussed. Prerequisite: ForS 264 or equivalent. Laboratory fee, $50.

280 **Intrusion II: Investigating Network-Based Attacks** (3)
Detecting and responding to network- and host-based intruders, integrating intrusion detection systems into network topologies, identifying methods hackers use to break into network systems, analyzing network traffic and detecting attacks, and creating an effective response strategy. Prerequisite: ForS 279. Laboratory fee, $50.

281 **Forensic Accounting** (3)
Principles of accounting: abuse and misuse of accounting procedures; use of accounting in the investigation of commercial crime.

282 **Telecommunication Systems for Security Professionals** (3)
Telecommunication systems infrastructure and operation. How telecommunication and computer systems are used in tandem to commit computer crime. Assessing and managing threats and vulnerabilities. Open only to students enrolled in the department or by approval of the program director.

283 **Steganography and Electronic Watermarking** (3)
Digital data hiding techniques. Investigation of data hiding and labeling techniques, attacks against steganography and watermarked information; countermeasures to such attacks. Open only to students enrolled in the department or by approval of the program director. Laboratory fee, $50. Prerequisite: ForS 277, 278.

284 **Security Management Capstone Course** (3)
Case study review of best practices in security management and development of measurable performance criteria for evaluating cost/benefit of a security program. Evaluations drawn from public and private sectors and proprietary and contract security services. Students design, develop, and evaluate a complete security system.

285 **High Technology Crime Investigation Capstone Course** (3)
For students in the final semester of the high-technology crime investigation program only. Simulation of a computer forensic investigation: developing an investigation plan, securing the crime scene, analyzing evidence, preparing the case for court, and testifying in a moot court situation. Laboratory fee, $50.

286 **Personnel Security** (3)
Principles of personnel security: personnel security investigations and preemployment screening. Assertive behaviors to keep the workplace safe and avoid liability exposure to negligent hiring.

290 **Selected Topics** (3)
Current issues in research, investigation, and law.

295 **Research** (arr.)
Research on problems approved by the department, under the supervision of an appropriate member of the program faculty. Admission by permission only.

298 **Forensic Sciences Practicum** (arr.)
Internship experience in a forensic science laboratory or criminal justice agency, under the supervision of an appropriate member of the program faculty. Students must preregister for this course. Admission by permission only.

299–300 **Thesis Research** (3–3)

GENETICS

M.W. Allard, J. Battey, P.E. Berg, J. Brady, K.M. Brown, A. Chiaramello, J. Chou, A. Colberg-Poley, S. Constant, R. Donaldson, T. Friedman, D. Goldman, G. Hager, R. Hawley, L.P. Hernandez, E. Hoffman, V.W. Hu, D.E. Johnson, F. Kashanchi, J. Keller, K.A. Kennedy, A. Kumar, S. Ladisch, J.W. Larsen, P. Latham, B. Lu, R. Mage, C.R. Merril, S. Moody, T.W. Moody, D. Morris, B. Moss, J. Natale, F. Noonan, S. O'Brien, S. Patierno, J. Quakenbush, M. Rose, T. Sargent, J. Schlom, C. Smith, S. Spence, M. Stepp, M. Sutherland, F. Turano

Columbian College of Arts and Sciences offers an interdepartmental program leading to the degrees of Master of Science and Doctor of Philosophy in the field of genetics. This program is directed by a committee whose members are drawn from the Departments of Anatomy and Cell Biology, Biochemistry and Molecular Biology, Biological Sciences, Microbiology and Tropical Medicine, Obstetrics and Gynecology, Pathology, and Pharmacology and from government agencies and private industry.

Requirements for admission are stated under Columbian College of Arts and Sciences. The undergraduate program must have included the following: 8 credit hours each in biology, inorganic chemistry, and organic chemistry, and 6 credit hours in physics. Two upper-level undergraduate courses in genetics, cell biochemistry, or cell or molecular biology are required for the M.S. and strongly recommended for the Ph.D. program.

Master of Science in the field of genetics—Required: the general requirements stated under Columbian College of Arts and Sciences. The 30 credit hours required in this program must include Gnet 201 and Gnet 299–300. The remaining 22 credit hours of course work are to be selected with the approval of the Committee on Genetics. A comprehensive examination must be passed. The program requires completion of a research project and a master's thesis based on the project.

Doctor of Philosophy in the field of genetics—Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study must include the biomedical sciences core curriculum, Gnet 301, 10–12 credit hours of genetics, and 3 credit hours of statistics.

In addition to the courses listed here, the Genetics Program Office maintains a list of approved courses that may apply to its degree programs, including courses drawn from biological sciences, statistics, public health, and the departments and programs within the biomedical sciences.

201 **Advanced Problems in Genetics** (2)
Lectures on selected topics by members of the Committee on Genetics. Required of all master's degree candidates in the Genetics Program. Prerequisite: degree candidacy or permission of program director. (Fall)

256 **Molecular Genetics of Inherited Diseases** (2)
Biochemical aspects of genetics and contributions of molecular biology to understanding of human mutations and hereditary diseases. Prerequisite: degree candidacy or permission of program director. (Spring)

260 **Molecular Genetics of Proteins** (3)
Laboratory techniques in gel electrophoresis and electroelution, high pressure liquid chromatography protein blotting, proteolytic and chemical cleavage of proteins, amino acid analysis, automated Edman degradations, peptide synthesis and computer-assisted analysis of protein structure. (Fall, even years)

295 **Research** (arr.)
Open to qualified master's degree students. Research on problems approved by the Committee on Genetics. May be repeated for credit. (Fall and spring)

299–300 **Thesis Research** (3–3)

301 **Advanced Problems in Genetics** (2)
Lectures on selected topics by members of the Committee on Genetics. Required of all Ph.D. candidates in the Genetics Program. Limited to students enrolled in the Genetics Program unless special permission is obtained from the director. (Fall)

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

GEOGRAPHY

Professor G.C. Stephens
Associate Professors M.D. Price (*Chair*), E. Chacko
Assistant Professors I. Cheung, L.M. Benton-Short, D. Rain
Professorial Lecturers G.T. Foggin, E. Bruner
Assistant Professorial Lecturers L. Marcus, M. Zeigler, P. Solis

Master of Arts in the field of geography—Prerequisite: a bachelor's degree with a major in geography or in a related field in the social or natural sciences.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work must include Geog 105 (*Techniques of Spatial Analysis*) and Geog 201.

Thesis and nonthesis options are available: The thesis option requires a minimum of 30 credit hours of course work, including Thesis Research; the nonthesis option requires completion of 36 credit hours of graduate work. All degree candidates must take a Master's Comprehensive Examination.

Students entering the program without a bachelor's degree with a major in geography will be required to take prerequisite courses as determined by the department. All entering students must have completed one course, or its equivalent, from each of the following groups: environmental geography (Geog 108, 132); population/cultural/political geography (Geog 127, 145, 146); urban geography (Geog 125, 140, 141).

Depending upon the chosen field of specialization, each student will select electives from appropriate courses within the department or from related programs and departments within the University or the Consortium of Universities. The student's program of study will be developed in consultation with the advisor and graduate committee.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Geographic Thought and Methods** (3) Rain
For first-year master's students, a survey of geographic thought, theories, and methods. Emphasis on contemporary issues in geography and urban planning and on the development of research.

207 **Urban Planning and Development** (3) Staff
Selected problems in urban and regional planning in the developing world: applications of zoning, environmental controls, and other techniques for achieving sustainable urban development.

208 **Land Use and Urban Transportation Planning** (3) Marcus
Relationships between land use and the movement of goods and people. Examination of land use and transportation planning principles, issues, and techniques. Roles of public and private interests in land use and transportation planning and management.

219 **Seminar: Urban Climate** (3) Cheung
Inadvertent climate modification due to urbanization and impacts on environmental and human health.

220 **Seminar: Climatic Change** (3) Cheung
Examination of natural and human-induced climatic change, at global, regional, and local scales.

222 **Seminar: Resources and the Environment** (3) Staff
Topics related to the spatial variations and interrelationships of resources and the environment; applications of geographic information systems and remote sensing. Prerequisite: permission of instructor. Laboratory fee, $55.

223 **Seminar: Population and Health** (3) Chacko
Interrelationships between population and the environment and impacts on human health.

224 **Seminar: Political Geography** (3) Zeigler
Examination of political factors in location theory and analysis of the nature of political territories and conflict.

225 **Seminar: Transportation and Development** (3) Staff
Transportation and communication in the organization of space.

230 **Seminar: Environmental Issues in Development** (3) Staff
A consideration of the differential regional implications of and responses to resource and environmental policy decisions due to regional differences in societal and physical parameters.

243 **Seminar: Urban Geography** (3) Benton-Short, Rain
Topics concerning social, political, economic, and environmental issues in U.S. cities.

244 **Seminar: Urban Environmental Issues** (3) Benton-Short
Urban environmental issues in developed and developing cities.

250 **Geographical Perspectives on Development** (3) Chacko
Theory and debates surrounding economic development in a globalizing world, with case studies.

261 **Geographical Perspectives on Latin America** (3) Price
Natural resources, the environment, and population dynamics through time.

265 **Seminar: Geography of the Former Soviet Union** (3) Staff
Survey of the regions and major topical themes of the geography of the former Soviet Union, including population, energy, agriculture, transportation, and regional development.

290 **Principles of Demography** (3) Boulier
Same as Econ/Soc/Stat 290.

291 **Methods of Demographic Analysis** (3) Boulier
Same as Econ/Soc/Stat 291.

295 **Research** (arr.) Staff
May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

HISTORY

Professors R. Thornton, P.F. Klarén, R.E. Kennedy, Jr., W.H. Becker, L.P. Ribuffo, E. Berkowitz, R.H. Spector, J.O. Horton, L.L. Peck, M.E. Saperstein, R.J. Cottrol, D.K. Kennedy, A.M. Black (*Research*), M.A. Atkin (*Chair*), T. Anbinder
Associate Professors R.B. Stott, H.L. Agnew, E.A. McCord, C.E. Harrison, D.R. Khoury, J. Hershberg, D. Yang, A.L. Alexander, S. McHale, H.M. Harrison, E.H. Cline
Assistant Professors N.G. Seavey (*Research*), A. Zimmerman, K.W. Larsen, M. Norton, N. Blyden, G.A. Brazinsky, H. Abugideiri, A. Lester, D. Silverman
Adjunct Associate Professor K. Bowling
Director and Principal Investigator of the First Federal Congress Project C. Bickford

Master of Arts in the field of history—Prerequisite: a bachelor's degree from an accredited college or university with a major in history, or with substantial course work in history of high academic quality; high scholastic standing; and approval of the department.

Required: the general requirements stated under Columbian College of Arts and Sciences and reading knowledge of one foreign language. A thesis program consists of a minimum of 30 credit hours of 100- and 200-level courses, including Hist 299–300, Thesis Research, and at least three other 200-level courses. A non-thesis program consists of a minimum of 36 credit hours of 100- and 200-level courses, including at least six 200-level courses, two of which must be research seminars. (See the Undergraduate Programs Bulletin for a listing of 100-level courses offered by the department.) Exceptions to the minimum for 200-

level courses can be granted only by the department's Graduate Programs Committee. Hist 201 is required of candidates who have not previously had a course in historiography and historical method. A maximum of 6 credit hours may be in approved courses outside the History Department. To receive graduate credit for 100-level courses, master's candidates must arrange for extra work with the instructors. Each student works in one major and one minor field. A major field consists of 15 credit hours. Major fields are listed below, under the Doctor of Philosophy in the field of history. A minor field consists of a minimum of 9 hours in any of the major fields or in another relevant field agreed upon between the advisor and student. The student is required to pass a comprehensive examination in a major field.

Master of Arts in the field of history with a concentration in historic preservation—Required: the general requirements stated under Columbian College of Arts and Sciences. This 36-hour degree program combines courses in United States history and historic preservation. It includes at least 18 hours of U.S. social history, U.S. urban history, man-made America, and the seminar sequence in historic preservation. For other course distribution requirements, see the departmental graduate advisor. Candidates in this program may also be required to pass an examination in measured architectural drawing.

Master of Arts in the field of history with a concentration in imperial and colonial studies—Required: the general requirements stated under Columbian College of Arts and Sciences. This 36-hour degree program emphasizes the comparative study of empires. Hist 242 and 243 are required, along with a 15-hour major regional field and a 6–9-hour minor regional field. Up to 9 hours may be chosen in related disciplines within the University. See the department graduate advisor for course and distribution requirements and the thesis option.

Master of Arts in the field of history with a concentration in public policy—Required: the general requirements stated under Columbian College of Arts and Sciences. This 36-hour degree program emphasizes the study of history as it relates to the analysis and conduct of public policy. Hist 214 and an internship are required. Additional course work is to be chosen with advisor's approval.

Master of Arts in the field of history with a concentration in U.S. legal history—Required: the general requirements stated under Columbian College of Arts and Sciences. This 36-hour degree program combines a major field in U.S. history with a special field in U.S. legal history. Students may take up to 9 hours of legal history offered by the Law School. For other course distribution requirements and the thesis option, see the departmental graduate advisor.

Doctor of Philosophy in the field of history—Required: the general requirements stated under Columbian College of Arts and Sciences, including the passing of a written examination in two appropriate foreign languages or in one foreign language and an approved subject (such as statistics or oral history), and the satisfactory completion of the General Examination in three fields.

Candidates in American history must select two major fields from early America (to 1815), 19th-century America (1815–1900), and 20th-century America (1900–). The minor field will normally be topical (e.g., U.S. social, U.S. diplomatic, historic preservation).

Candidates in imperial and colonial history take Hist 242 and 243 and select two major and one minor field/period. The student should consult with the graduate committee on the combination of courses to be taken. Fields can include, but are not limited to, such combinations as Europe and the Americas (1500–1900), Europe and Asia, Europe and the Middle East, Europe and Africa, the U.S. and Asia, and China and Japan.

Candidates in Asian history select two major fields from modern China, modern Japan, and modern Southeast Asia. The minor field is chosen in consultation with the graduate committee.

Candidates concentrating in areas other than those outlined above must select one major and two minor fields. Major fields are early modern Europe, modern Europe, Latin America, modern Middle East, modern Eastern Europe, modern Russia, and military history. The minor fields may be either topical (e.g., European intellectual) or chronological (e.g., Tudor and Stuart England, colonial Latin America).

All candidates may choose to be examined in one minor field other than history if it is relevant to the program of study. Students having a minor field in historical preservation may be required to pass an examination in measured architectural drawing.

Doctor of Philosophy in the field of American religious history (offered in cooperation with the Department of Religion)—Required: the general requirements stated under Columbian College of Arts and Sciences and the specific requirements of the Doctor of Philosophy in the field of history, stated above. The General Examination must cover four fields, including two from the Department of History (generally American social history and one other) and two from the Department of Religion (history of religion in America and one other field in religious history).

Note: Undergraduates may register for graduate courses only with permission of the instructor.

201 **History and Historians** (3) Zimmerman, Stott
Historiography and historical method for graduate students. Readings and discussions on major trends in history; selections from classics of historical literature. Students who receive credit for Hist 201 cannot receive credit for Hist 198. (Spring)

203–4 **Seminar: Research or Readings** (3–3) Staff
Offered on demand for individual research programs. Prerequisite: approval of department. (Academic year)

205–6 **Seminar: Eastern European History** (3–3) Agnew
Hist 205: 1772–1918; Hist 206: 1919–1945. (Academic year)

212 **Nature vs. Nurture in American History** (3) Staff
Social and cultural survey of the uses of biology in addressing social problems, including social Darwinism, eugenics, scientific medicine, DNA forensics, and cloning.

214 **Seminar: History and Public Policy** (3) Berkowitz
Seminar in the use of historical insights and methods in policymaking, with emphasis on domestic issues. Assessment and use of primary sources for policy analysis and the use of historical analogy in policy formulation.

217 **Seminar: Russian and Soviet Thought** (3) Atkin
Selected topics in the intellectual and cultural history of 18th- to 20th-century Russia and Soviet Union. May be taken as a readings seminar or, with instructor's approval, as a research seminar. Admission by permission of instructor. (Spring)

218 **Readings/Research Seminar: Soviet Nationalities** (3) Atkin
An examination of the relationship between the USSR's multinational composition and its domestic political, economic, social, and cultural policies and foreign relations. May be taken as a readings seminar or, with instructor's approval, as a research seminar. Admission by permission of instructor. (Spring)

219 **Internship in History and Public Policy** (3 or 6) Berkowitz
Supervised participation in an office or agency concerned with the formulation of public policy; terms of the internship are arranged with the director of the History and Public Policy Program. Enrollment restricted to students in the History and Public Policy Program. (Fall and spring)

220 **American Business History** (3) Becker
The history of American business institutions in manufacturing, distribution, transportation, and finance. Particular attention will be given to the period since industrialization, with consideration of business institutions in their economic, legal, governmental, and social contexts. Same as SMPP 293. (Spring)

224 **Readings/Research Seminar: European Intellectual History** (3) E. Kennedy
Topics in 18th- and 19th-century European thought, with an emphasis on France. Specific topic announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

226 **U.S. Media and Cultural History** (3) Staff
Same as AmSt 226.

228 **Topics in Modern Military and Naval History** (3) Spector
Discussion, readings, and research in 20th-century European and American military and naval history.

229 **Seminar: World War II** (3) Spector
Examination of statecraft and the management of force before, during, and after World War II. Special attention to broad aspects of military policy and strategy and their interaction with international politics and diplomacy.

230 **Readings/Research Seminar: Strategy and Policy** (3) Spector
A study of the historical development of strategy and the relationship of military thought to national policy.

231 **The Age of the Battleship: An Introduction to Modern Naval History** (3) Spector
The rich and varied literature of naval history, with emphasis on interactions among technology, nationalism, and domestic political/social developments in the late 19th and early 20th century. The social history of navies is included. (Spring)

232 **Islam and Social Movements** (3) Khoury
An examination of the relationship of religion and religious symbols to social and political movements in the Islamic world. (Fall, alternate years)

233 **Nationalism in the Middle East** (3) Khoury
Different interpretations of nationalism and their applicability to nationalism in the Middle East. (Spring, alternate years)

234 **Imperialism in the Middle East** (3) Khoury
An exploration of the process of European and American expansion in the Middle East. (Fall, alternate years)

237 **Readings/Research Seminar: Soviet Foreign Policy, 1917–1991** (3) H. Harrison
Concepts and perceptions guiding Soviet relations with the outside world. From the blockade and intervention, through years of isolation, World War II, the Cold War, to "peaceful coexistence."

239 **Seminar: Early Modern European History** (3) Staff
Topics selected from Western European history of the 14th through 17th centuries.

240 **Seminar: English People and Institutions** (3) Peck
Selected topics in the political, social, intellectual, and economic history of England. Focus upon one time period and special area of interest. May be taken for research credit with instructor's approval. (Fall and spring)

241 **Readings/Research Seminar: Modern European History** (3) Staff
Prerequisite: appropriate preparation and consent of instructor.

242 **Europe and the World, 1500–Present** (3) D. Kennedy
An introduction to some of the key debates and scholarship concerning European imperialism.

243 **Modernization, Imperialism, Globalization** (3) Zimmerman
Readings seminar in classic and recent theories of modernization, imperialism, and globalization. (Spring, alternate years)

244 **Sexuality in U.S. History** (3) Staff
Same as AmSt/WStu 244.

246 **Readings/Research Seminar: History of Modern Russia and the Soviet Union** (3) Atkin
Selected topics in the domestic history of modern Russia and Soviet Union. May be taken as a readings seminar or, with instructor's approval, as a research seminar. Admission by permission of instructor. (Fall)

249 **Research Seminar: European Diplomatic History** (3) Staff
Research seminar in individually selected topics concerning the foreign policies, actions, and interrelations of the European great powers and their statesmen in the 19th or 20th century. Reading knowledge of one language other than English required. (Fall)

250 **History of International Systems** (3) Staff
The ways history can illuminate the study of international affairs. Topics may vary. May not be repeated for credit.

251 **Uses of History in International Affairs** (3) H. Harrison
This course is similar to Hist 250 but with an emphasis on public policy rather than historiography.

253–54 **Seminar: History of Sino-Soviet Relations** (3–3) Thornton
Readings seminar designed to develop analytic and historiographic skills. Fall: turn of the century to the Korean War; spring: from the foundation of the People's Republic to the collapse of the Soviet Union and its consequences. (Alternate academic years)

255–56 **Seminar: U.S.–Soviet Strategic Relations: World War II to 1991** (3–3) Thornton
Readings seminar designed to develop a conceptual framework for understanding contemporary U.S.–Soviet relations. Fall: World War II through the Johnson administration; spring: the administrations of Nixon, Carter, and Reagan. (Academic year)

257 **Re-thinking Cold War History** (3) H. Harrison, Hershberg
A reading and research course that relies heavily on documents from formerly closed communist archives and recently declassified Western materials. Various issues and events of the Cold War; old and new historiographical controversies. Students write a primary-source research paper to elucidate one of the many aspects of the Cold War about which new evidence is available.

259–60 **Research Seminar: Problems in U.S.–Soviet–Chinese Relations** (3–3) Thornton
Development of scholarly skills through preparation of a research paper. Prerequisite: Hist 254 or 255 or permission of instructor. (Alternate academic years)

261–62 **Readings/Research Seminar: Topics in Modern Latin America** (3–3) Klarén
Admission by permission of the instructor.

264 **Readings/Research Seminar: Immigration and Ethnicity in the United States** (3) Anbinder
Trends and theoretical issues in the study of American immigration and ethnicity.

265 **Readings/Research Seminar: The Era of the Civil War, 1850–1877** (3) Anbinder
The sectional crisis that led to the Civil War; the conflict itself in its military, political, and social dimensions; attempts at racial and sectional reconciliation made during Reconstruction.

267 **Seminar: American Social Thought Since World War II** (3) Ribuffo
Consideration of C. Wright Mills, Daniel Bell, Abraham Maslow, Christopher Lasch, Paul Goodman, Martin Luther King, Jr., Barbara Ehrenreich, and other major social critics. (Fall)

268–69 **Readings and Research in American Cultural History** (3–3) Staff
Same as AmSt 268–69.

270 **Theory and Practice of Public History** (3) Horton
Same as AmSt 270.

271–72 **Readings/Research Seminar: U.S. Social History** (3–3) Horton
Hist 271: Readings seminar on American daily life, institutions, and intellectual and artistic achievements. Hist 272: Research seminar. Hist 271 is prerequisite to Hist 272. Same as AmSt 271–72.

273 **Readings on Women in American History** (3) C. Harrison
Important works in American women's history; evolution of the field in historiographical context. Same as AmSt/WStu 273.

274 **Readings Seminar: 19th-Century American History** (3) Anbinder
Important trends in historical writing about 19th-century America. (Alternate years)

275–76 **Readings/Research Seminar: Early American History** (3–3) Silverman
Readings in the fall, research in the spring. Admission by permission of instructor. (Alternate academic years)

277–78 **Historic Preservation: Principles and Methods** (3–3) Longstreth
Same as AmSt 277–78.

282 **History of U.S. Foreign Policy, 1898–1980** (3) Hershberg
Readings, lectures, discussion on major developments in the conduct of American diplomacy. (Fall and spring)

283–84 **Readings/Research Seminar: Recent U.S. History** (3–3) Ribuffo
Prerequisite: 6 credit hours of 100-level American history courses. Research or readings, depending on students' interests and curricular needs.

285 **U.S. Legal History** (3) Cottrol
The legal history of the United States from the 17th century to the present. The course examines legal change within the broader context of political, social, and economic change. Admission by permission of instructor. Same as Law 591. (Spring)

286 **The Law of Race and Slavery** (3) Cottrol
The role of legal norms and processes in developing patterns of slavery and race relations in the United States and other societies. Admission by permission of instructor. Same as Soc 286 and Law 596. (Spring)

287 **U.S. Urban History** (3) Staff
Same as AmSt 287.

288 **Modern Southeast Asia** (3) McHale
The modern history of Southeast Asia from the 1800s to 1975. Colonialism, rise of postcolonial states, revolutions and persistence of the past. (Fall)

289 **Seminar: Modern Japanese History** (3) Yang
Selected topics in modern Japanese history from the Meiji Restoration of 1868 to the present. Research or readings depending on students' interests and curricular needs. (Spring)

291 **Readings/Research Seminar: 20th-Century History** (3) Staff
Research or readings on selected topics. (Fall)

293 **Research Seminar: Modern East Asian History** (3) McCord, Yang

294 **Research Seminar: The Modern Middle East** (3) Khoury
Readings, discussion, and research in selected political, economic, social, cultural, and intellectual trends. (Spring)

295 **Readings Seminar: Late Imperial China** (3) McCord
Selected topics in the history of modern China in the late imperial period, with a particular focus on the internal and external challenges to the last Chinese dynasty in the 19th century. (Fall)

296 **Readings Seminar: 20th-Century China** (3) McCord
Selected topics in the history of modern China from the 1911 Revolution to the Cultural Revolution. (Spring)

297 **Special Topics Seminar** (3 to 9) Staff
Open to doctoral and master's candidates and qualified undergraduates. May be repeated for credit provided the topic differs. Offered whenever five or more students can be enrolled.

298 **Readings/Research Seminar:** Larsen, Brazinsky
Special Topics in Korean History (3)
Intensive exploration of the history of Korea in modern times (1850–present). Korean identity and the challenges of foreign imperialism, industrialization, modernization, and globalization.

299–300 **Thesis Research** (3–3) Staff

301–2 **Folger Institute Seminars** (3–3) Staff
Topics will be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs. Consult the chair of the department before registration.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

HOMINID PALEOBIOLOGY

Committee on Hominid Paleobiology
B. Wood (*Chair*), M. Allard, K. Behrensmeyer, A. Brooks, J. Clark, G. Dunston, R. Kittles, J. Long, S. Moody, R. Potts, B. Richmond, S. Tishkoff, D.H. Ubelaker

Columbian College of Arts and Sciences offers an interdisciplinary program leading to the degrees of Master of Science and Doctor of Philosophy in the field of hominid paleobiology. Participating faculty are drawn from the Departments of Anthropology, Biological Sciences, Anatomy, and Earth and Environmental Sciences at GW; the Departments of Anthropology and Paleobiology at the National Museum of Natural History, Smithsonian Institution; the Department of Microbiology at Howard University; the Departments of Anthropology and Biology at the University of Maryland; and the National Institutes of Health.

A bachelor's degree in anthropology, biology, geoscience, or zoology from this University, or an equivalent degree from another accredited institution of higher learning, is required for admission into the program. Prerequisites include the following.

1) Advanced undergraduate course work in biology, including courses in evolution and any two of the following: genetics, developmental biology/embryology, anatomy, physiology, ethology, ecology, and paleontology. GW courses that correspond to these subjects are BiSc 107, 108, 114, 122, 123, 132, 150, 151, 152, 154, 156.

2) Advanced undergraduate course work in anthropology, including courses in any two of the following: osteology, human biology, paleoanthropology, primatology, and Paleolithic archaeology corresponding to Anth 114, 141, 142, 145, 146, 147, 148, 149, 181, 183; course work in statistics corresponding to Stat 91 and 127; course work in mathematics, including precalculus, corresponding to Math 20–21 or 30.

In addition, advanced undergraduate course work in one or more of the following subjects is desirable: chemistry, biochemistry, physics, geoscience, and calculus.

Exceptional applicants who lack some of the prerequisites may be admitted to the program on a provisional basis, but formal admission will be conditional on the satisfactory completion of appropriate deficiency courses in the first year.

Master of Science in the field of hominid paleobiology—Required: the general requirements stated under Columbian College of Arts and Sciences. The program includes 30 credit hours of course work, plus a thesis (equivalent to 6 credit hours). Required courses include Anth 147, 283, BiSc 210, EES 254, and two laboratory or field research courses in different disciplines. Electives are selected in consultation with the committee from a list of relevant courses in anatomy, anthropology, biological sciences, and geology.

Doctor of Philosophy in the field of hominid paleobiology—Required: the general requirements stated under Columbian College of Arts and Sciences. The program includes a minimum of 48 credit hours of course work, plus a dissertation (equivalent to 24 credit hours). Required courses are Homp 301, 302, 303; Anth 147, 283; BiSc 210; and EES 254. The remainder of the course work is to be distributed among various interdisciplinary courses, including but not limited to the following: Anth 141, 142, 247; Anat 210, 212, 260; BiSc 114, 132, 216, 228, 230; EES 140, 255, 263.

Three of the chosen courses must include a substantial independent research project. These research components must involve at least two different disciplines and may include approved field courses. Electives are to be selected as for the master's degree. For detailed requirements, consult the chair of the doctoral program committee.

Research fields: Any subdiscipline of anatomy, anthropology, biology, ecology, or geoscience that pertains to research in the field of hominid paleobiology. At least one of the student's research fields must be in a discipline other than anthropology.

201 **Hominid Paleobiology** (3)
Study of human evolution through investigation of the fossil record; current research in reconstructing paleobiology. Macroevolutionary theory, site formation, phylogeny and behavior reconstruction, and the taxonomy, site context, anatomy, behavior, and major issues surrounding each hominin taxon.

295 **Research** (arr.)
Research on problems approved by the director of the program. Open to qualified students with advanced training. May be repeated for credit.

299–300 **Thesis Research** (3–3)

301 **Problem-Based Learning Seminar** (1 to 3)
Problem-based tutorial in hominid paleobiology. Development of research skills through problem-solving tasks in a small group. May be repeated for credit.

302 **Public Understanding of Science Internship** (3)
Supervised participation in an institution that presents science to the public. Opportunity to participate in procedures and gain practical experience in disseminating scientific information to non-scientists.

303 **Paleobiology Lab Rotation** (2 or 3)
Supervised participation in a relevant laboratory. Students learn analytical techniques, handle diverse types of data, and encounter a range of disciplines as preparation for later participation in interdisciplinary research projects. Admission by permission of the program chair. May be repeated for credit.

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

HUMAN DEVELOPMENT and HUMAN RESOURCE DEVELOPMENT

See **Counseling/Human and Organizational Studies.**

HUMAN SCIENCES: AN INTERDISCIPLINARY PROGRAM IN LANGUAGE, CULTURE, AND SOCIETY

Director G. Weiss

Columbian College of Arts and Sciences offers an interdisciplinary program leading to the degree of Doctor of Philosophy in the field of human sciences. The program is administered by a committee whose members are drawn from cooperating departments and programs, which include American Studies, Anthropology, English, Fine Arts and Art History, German and Slavic Languages and Literatures, History, Philosophy, Political Science, Religion, Romance Languages and Literatures, and Women's Studies.

The program in the human sciences is part of the growing interdisciplinary trend that employs methods and principles common to the humanities and social sciences for examination of culture and meaning. Toward that end, first-year students take two interdisciplinary seminars and pursue inquiry in four core areas: language, meaning, and interpretation; historical issues in the human sciences; culture and society; techniques of critical reading. Along with human sciences courses given under these core titles, the program maintains a list of selected departmental courses that may be taken for each specific core area. In addition, each student pursues a specialization in one of the cooperating departments or in an area approved by the program.

General requirements for the degree are stated under Columbian College of Arts and Sciences. A Bachelor of Arts with a major in one of the cooperating disciplines or a related discipline is required for admission.

The program of study must include the following. (1) Two proseminar courses taken in the first year. (2) A first-year examination administered at the end of HmSc 202, with satisfactory performance necessary for continued enrollment in the program. (3) One designated core course in each of the four core areas. (4) Demonstrated advanced proficiency in one foreign language. (5) A General Comprehensive Examination that covers the core requirements and a Field Examination in the student's chosen concentration. (6) Oral evaluation of the dissertation proposal prior to advancement to candidacy for the Ph.D. (7) A satisfactory interdisciplinary dissertation.

In addition to core courses, students pursue graduate course work for which they are qualified in any of the cooperating departments. Lists of applicable courses are available prior to registration each semester.

201 **The Idea of the Human Sciences** (3)
Critical inquiry into the genesis and structure of theories that seek to account for human creativity, meaning, and interpretation and their textual, cultural, and institutional embodiments, from antiquity to late modernity.

202 **Contemporary Theory in the Human Sciences** (3)
Critical examination of major theoretical strategies employed by current practitioners of the human sciences. Topics may include phenomenology, hermeneutics, psychoanalytic theory, ethnography, deconstruction, feminist theory, post-colonialism, and critical race theory.

203 **Language, Meaning, and Interpretation** (3)
Focus on language within a wide domain of inquiry that includes linguistics, semiotics, hermeneutics, narratology, speech act theory, language games, orality, writing, and gender, race, and class.

204 **Historical Issues in the Human Sciences** (3)
Theoretical examination of history and the nature of historical knowledge. Topics may include philosophies and theories of history, eschatology, pre- and post-colonialisms and modernities, and national histories and mythologies.

205 **Culture and Society** (3)
Critical examination of cultural practices and social institutions from an interpretive perspective. Selected readings in cultural theory and cultural studies.

206 **Techniques of Critical Reading** (3)
Critical reading of one or more texts, utilizing the theoretical strategies of the human sciences. For purposes of this course, texts may include any human artifacts or constructions that are invested with meaning.

295 **Directed Reading and Research** (3)
Supervised reading in selected fields within the human sciences. May be repeated once for credit.

297 **Special Topics in Human Sciences** (3)
Open to master's and doctoral students. May be repeated for credit provided the topic differs.

310 **Advanced Seminar in Human Sciences** (3)
Advanced topics, theories, and methods in different fields of the human sciences. Limited to doctoral candidates preparing to do their dissertation. May be repeated for credit provided the topic differs.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

IMMUNOLOGY

D. Leitenberg (*Director*), M. Bukrinsky, S. Constant, W. Davidson, E. DeFabo, B. Fowlkes, J. Hawdon, P. Hotez, S. Ladisch, R. Mage, S. Mendez, N. Noben-Trauth, F. Noonan, M. Rose, J. Schlom, D. Scott, C. Smith, S. Vukmanovic, M. Williams

Doctor of Philosophy in the field of immunology—Prerequisite: A bachelor's degree in biological sciences, chemistry, or a related field.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work must include the biomedical sciences core curriculum, Immu 230, three semesters of Immu 270, and Stat 225. Recommended electives include Bioc 234, 250; Micr 233; Onco 221, 222.

Research fields: Apoptosis, autoimmunity, T-cell development, gene therapy, immune regulation, phylogeny of the immune system, tumor immunology, UV effects on cellular immunity, asthma, allergy.

230 **Molecular and Cellular Immunology** (4)
Major aspects of immunology, including T and B cell development, the major histocompatibility complex, and immune regulation. Prerequisite: BmSc 213 or equivalent with approval of staff. (Fall)

270 **Advanced Topics in Immunology** (3)
Seminar series on topics chosen jointly by students and faculty; students present and critique original manuscripts. May be repeated for credit. Prerequisite: Micr 229, Immu 230, or approval of staff. (Spring)

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

INTERNATIONAL AFFAIRS

University Professor J.N. Rosenau

Professors G.M. Adams (*Practice*), C.J. Allen, H.G. Askari, M.A. Atkin, W.H. Becker, E. Berkowitz, R. Bhala, A. Black (*Research*), B.L. Boulier, M.D. Bradley, N.J. Brown, J. Chaves, J.J. Cordes, W.K. Cummings, H.J. Davis, C.J. Deering, R.M. Dunn, Jr., M.A. East, H.B. Feigenbaum, J. Ferrer (*Research*), M. Finnemore, L. Fuerth (*Research*), J. Goldgeier, D. Gow (*Practice*), R. Grinker, H. Harding, P. Hotez, K.F. Inderfurth (*Practice*), G. Kaminsky, D.K. Kennedy, R.E. Kennedy, Jr., Y.K. Kim-Renaud, P.F Klarén, J. Kuipers, J.M. Logsdon, G. Ludlow, M. Marquardt, C. McClintock, B.D. Miller, M.O. Moore, H.R. Nau, J. Pelzman, J.M. Post (*Practice*), B. Reich, W. Reich, L.P. Ribuffo, R.W. Rycroft, D. Shambaugh, S.C. Smith, M. Sodaro, R.H. Spector, R. Steinhardt, J.-F. Thibault, R. Thornton, N.S. Vonortas, R. Weiner, R. Williamson (*Research*), S. Wolchik, H.L. Wolman, A.M. Yezer

Associate Professors H.L. Agnew, D. Avant, S. Balla, A. Bowie, J. Brinkerhoff, Y. Captain, E. Chako, R.W. Click, B.J. Dickson, M. Gonglewski, D.A. Grier, S. Hamano, H.M. Harrison, J. Hershberg, D. Khoury, K.W. Larsen, J.H. Lebovic, D.L. Lee, S. Livingston, M. McAlister, E.A. McCord, S. McHale, M.M. Mochizuki, M. Price, J.A. Quiroga, S. Rehman, R. Robin,

F. Robles, P. Rollberg, S. Sell, M.B. Stein, S. Suranovic, H.J. Teegen, G.C.Y. Wang, R. Weiner, L. Willnat, D. Yang, J. Yang
Assistant Professors H. Abugideiri, N. Blyden, G. Brazinsky, M. Cipriani, M. Haider, I.L. Hanami, K. Lord, S. Lubkemann, K. Morgan, E.A. Posner, A. Prakash, C. Rector, L.A. Riddle, J. Ryfa, R.L. Skolnik (*Research*), J.M. Smith, E. Voeten, J.H. Williams, L. Willnat, A. Zimmerman
Adjunct Professors R. Butterworth, S. Commins, J. Hardt, S. Johnson, J. Kilpatrick, L. Kjonnerod (*Practice*), M. Kuchinsky, J. Mendelsohn, B. Powers (*Practice*), R.M. Samaniego, D. Shinn, R. Sutter, W. Wise
Adjunct Associate Professor K. Thachuk
Adjunct Assistant Professor K. Healy

Master of Arts in the field of international affairs—This multidisciplinary program, offered by the Elliott School of International Affairs, provides a framework that prepares students for professional positions in a broad range of international careers. As outlined below, students complete a three-course core field, a four-course major field, skills-based courses, electives, and a capstone course.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a bachelor's degree in a related field. Required: the general requirements stated under the Elliott School of International Affairs. All degree candidates must take a minimum of 40 credit hours of course work. Students may write a thesis if they meet requirements stated under Thesis Option in the Elliott School section of this Bulletin.

Core field—The core field consists of Hist 250 or 251, PSc 240, and either Econ 280 or Econ 283 and 284. Students choosing international development studies as their major field take Econ 250. Students with sufficient academic background may waive any of these core courses with approval of a designated faculty member from the department concerned.

Major field—The major fields include international security studies; international economic affairs; international affairs and development; international public health; technology and international affairs; international law and organizations; conflict and conflict resolution; U.S. foreign policy; Asia; Latin America; Middle East; Europe and Eurasia. Students who choose a regional major field are required to take one course chosen from PSc 230, 234, 235, 236, 237, or 288. Program guidelines available from the Elliott School list specific courses that pertain to these major fields. A student may petition the dean to design a special major field.

The academic program must include 3 credit hours of skills-based courses (IAff 201, 202). One credit of IAff 205 may also be applied to this requirement. Specific course offerings are listed in the *Schedule of Classes*.

Reading and oral proficiency in a modern foreign language must be demonstrated during the final 20 hours in residence. Up to 6 hours of foreign language credit may be counted toward the degree.

All degree candidates participate in a capstone course. Students may sign up to participate if they have completed or are registered for 30 of the program's required 40 credits. Those pursuing the thesis option may participate at 28 of the required 34 credits.

Consult program guidelines available from the Elliott School for more details about program requirements.

The following courses carry the International Affairs (IAff) designation. All other courses listed above will be found under the appropriate department designation.

201 **Skills Workshop** (1 or 2) Staff
Short courses designed to focus on developing specialized skills for international affairs professions. Topics announced in the *Schedule of Classes*.

202 **Topics Workshop** (1 or 2) Staff
Short courses designed to focus on developing specialized knowledge for international affairs professions. Topics announced in the *Schedule of Classes*.

203 **MIPP Seminar and Practicum** (3) Staff
For Master of International Policy and Practice candidates only.

204 **International Negotiating and Mediating Behavior** (3) Staff

205 **Language Workshop** (1 to 3)
Special courses designed to develop advanced language skills for international affairs professionals. Courses in specific languages announced in the *Schedule of Classes*.

206 **International Affairs Capstone Course** (1) Staff
Open only to graduating M.A. candidates in international affairs.

207 **Asian Studies Capstone Course** (0 or 1) Staff
Open only to graduating M.A. candidates in Asian studies.

208 **ITIP Capstone Course** (0 or 1) Staff
Open only to graduating M.A. candidates in international trade and investment policy.

209 **SPS Capstone Course** (3) Staff
Open only to graduating M.A. candidates in security policy studies.

211–12 **Multidisciplinary Seminar in Development** (3–3) Gow and Staff
Assessment of economic, political, social, technological, and environmental factors as they interact to affect development, with emphasis on individual human capabilities, and capabilities of indigenously initiated or administered economic and social organizations. For degree candidates in international development studies only. (Academic year)

213 **European and Eurasian Studies Capstone Course** (3) Staff
Open only to graduating M.A. candidates in European and Eurasian studies.

220 **Science, Technology, and Public Policy** (3) Logsdon, Rycroft, Vonortas
Introduction to the study of science, technology, and public policy; focus on policy issues that arise from interactions between scientific and technological developments and government activity. (Fall)

221 **Technology Creation and Diffusion** (3) Vonortas
Examination of the relationship between invention (inception), innovation (first application), and dissemination (diffusion) of technological knowledge; focus on the technological environment currently prevailing in the major developed market economies with historical references. (Fall)

222 **Technology Cooperation in Strategic Alliances** (3) Vonortas
Examination of technical alliances and joint research ventures: incentives to collaborate, advantages and disadvantages of such agreements for the parties involved, and policy implications. The role of multinational corporations and of smaller, technology-based firms.

223 **U.S. Space Policy** (3) Logsdon
Investigation of the origins, evolution, current status, and future prospects of U.S. national space policy and the space programs of the U.S. government in their international context. (Fall)

224 **Issues in U.S. Space Policy** (3) Logsdon
A seminar designed to undertake in-depth analysis of a current space policy issue. Team research format involving preparation of a comprehensive assessment of that issue and policy recommendations regarding its resolution. May be repeated for credit. (Spring)

225 **Environmental Policy** (3) Rycroft
A seminar examining public policy designed to protect the human and physical environment; focus on the ways science and technology simultaneously create new environmental problems and contribute to their mitigation and prevention. (Spring)

229 **Multidisciplinary Seminar in Science, Technology, and Global Affairs** (3) Logsdon, Rycroft, Vonortas
The capstone course for STPP, this course combines a lecture series and a workshop on an ongoing science and technology issue. Focus on a cross-disciplinary policy concern. For degree candidates in science, technology, and public policy only. Prerequisite: IAff 220. (Spring)

253 **Defense Policy and Program Analysis I** (3) Staff
Examination of how national security policy is formulated and translated into a defense budget, program priorities, and force structure. Focus on nuclear forces. (Fall and spring)

254 **Defense Policy and Program Analysis II** (3) Staff
Analysis of development of national security policy and the use of analytic techniques to derive a defense program and force structure from it. Special attention to general purpose forces. (Spring)

256 **National Security Resources** (3) Staff
National security resource planning and the federal budget-making process in relation to international affairs and defense.

257 **Transnational Security Issues** (3) Staff
The national security challenges posed by transnational threats; policy decision making in response; future trends.

258 **NATO and European Security** (3) Staff
A survey of the Cold War and in-depth consideration of major strategic security problems of the Cold War. Post–Cold War changes in NATO; the pros and cons of NATO expansion; and the post–Cold War security environment in Europe. (Spring)

270 **NGOs and Development** (3) Staff
A critique of the work of non-governmental organizations (NGOs) with reference to urbanization, rural development, and trends in international development planning. NGO–state relations; international NGOs and grassroots organizations. (Spring)

281 **Taiwan: Internal Development and Foreign Affairs** (3) Staff
A multidisciplinary course that examines the social, political, and economic development in Taiwan since World War II and its foreign affairs.

282 **Asian Regional Security** (3) Staff
The nature, elements, and future of security in the Asia–Pacific region. Various analytical frameworks are examined to understand the interplay of national interests, ideology, regionalism, etc. Specific issues in regional security. (Spring and summer)

286 **Latin America: Problems and Promise** (3) Staff
Multidisciplinary foundation course for the Latin American Studies program. Introduces students to key issues in Latin American studies.

287 **Problems in Latin American Civilization** (3) Klarén and Associated Faculty
Interdisciplinary capstone course for M.A. candidates in Latin American studies; each student writes a report on some aspect of a selected key theme. Admission by permission of instructor. (Spring)

290 **Special Topics in International Affairs** (3) Staff
Courses designed to focus on international affairs issues of a current or topical nature. Topics announced in the *Schedule of Classes*.

293 **Colloquium: National Defense Policies and Issues** (3) Staff
Colloquium for advanced students of security policy studies. Admission by permission of the instructor.

295 **Colloquium: Europe and Eurasia** (3) Sodaro
Survey of current research on Europe and Eurasia. Research paper required. Required of M.A. candidates in European and Eurasian studies; open to others with permission of the instructor. (Fall)

296 **UNA/International Organization Seminar/Internship** (3) Staff
For selected M.A. candidates in the Elliott School. The course includes seminar meetings, an internship at a United Nations agency or related organization, and a research paper.

297 **Graduate Internship in International Affairs** (0) Staff
Structured practical experience. Permission of instructor required.

298 **Independent Study and Research** (1 to 3) Staff
Limited to M.A. degree candidates. Written permission of instructor required.

299–300 **Thesis Research** (3–3) Staff

INTERNATIONAL BUSINESS

Professors Y.S. Park, H.G. Askari, F. Robles, R. Weiner (*Chair*)
Associate Professors S.S. Rehman, J. Yang, H.J. Teegen, R.W. Click, J. Ferrer (*Research*), J.W. Spencer
Assistant Professors P. Dastidar, L.A. Riddle, M. Ayyagari, R. Kosova
Instructor A. Kirca

See the School of Business for programs of study in business administration leading to the degrees of Master of Business Administration and Doctor of Philosophy.

Departmental prerequisite: MBAd 240 or Econ 283 or 284 is prerequisite to all courses in the International Business Department. Additional prerequisites appear with some IBus courses below.

260 **Global Competitive Frameworks** (3) Rehman
How industries develop sustained competitive advantages within the global framework. The European Union's "single market" and the Economic–Monetary Union; the transformation of formerly centrally planned economies; the

changing Japanese economy and emerging Pacific Basin, with implications for the U.S. economy, industries, and firms.

263 **Legal Aspects of International and Multinational Business** (3) Staff
Legal environment of international and multinational business including legal systems, antitrust laws, regulation of direct investment, international arbitration and expropriation; topics of current interest.

264 **International Business Strategy** (3) Click, Spencer
Discussion of the changing nature of the international environment and the resulting impact on strategy of both U.S. and foreign multinational corporations. Various aspects of strategy are considered, including marketing, production, and financial strategy. The focus of discussion is at the company level.

266 **International Marketing** (3) Robles, Riddle
International marketing strategy formulation, including market entry, local market development, and global market integration. The strategic challenge of global marketing formulation and local market adaptation, with attention to market conditions in mature, new growth, and emerging market environments. Emerging trends in international marketing.

267 **Regional International Marketing Systems** (3) Robles
The business, economic, investment, and market environments in the world's most dynamic emerging regions of Asia and Latin America. Nature and impact of economic reforms, direct investment patterns, regional integration, and competitiveness in regional markets. Formulation of regional strategies for multinationals from within and outside the regions.

268 **International Marketing Practicum** (3) Robles
Field experience in developing international marketing strategy formulation. Small groups of students develop recommendations for international market entry strategies in a practical setting. Prerequisite: permission of instructor.

269 **Managing in Developing Countries** (3) Riddle, Teegen
The course introduces managers to the distinctive nature and challenges of developing countries, provides a framework to analyze key management issues, and applies management techniques in these important markets.

271 **International Business Finance** (3) Park, Rehman, Weiner, Yang, Askari, Click
Analysis of major issues and developments in international business financial management and their impact on multinational corporations and financial institutions. Prerequisite: MBAd 250.

272 **Currency and Banking Crises in Emerging Markets** (3) Staff
Public policy issues surrounding financial crises in emerging market economies. Comparison of the economic reasons for the crises as well as the responses of various governments and international financial institutions.

273 **Seminar: International Banking** (3) Park, Yang
International financial intermediation and international banking. Functioning of international financial markets, public policy issues in international banking, regulation of international banking institutions, and the effect of international banks on national monetary policies.

274 **Global Investment Banking** (3) Park
Examination of investment banking as practiced in a global context from a strategic perspective using case studies and readings. Topics covered include securities underwriting and derivatives instruments, risk management, and business development strategies.

275 **External Development Financing** (3) Staff
Institutions, instruments, and theory of external development financing; financial flows to developing countries; development finance and the role of international and regional development banks; policies, methods, and practices of the World Bank, the IMF, and others; technical assistance, training, capacity building, and role of institutions in sustained development.

276 **Seminar: International Financial Markets** (3) Park, Askari, Weiner
Survey of international financial markets, focusing on structure and pricing. Primary emphasis on markets for foreign exchange, Eurocurrency, international bonds, and commodities. Derivatives markets, especially swaps and options. Prerequisite: IBus 271.

277 **International Portfolio Management** (3) Weiner
Theory and practice of international investment. Portfolio construction and optimization. Effects of exchange rate changes on portfolio risk and return. International asset pricing models and trading institutions. Prerequisite: MBAd 250; either MBAd 240 or Econ 284.

278 **International Business Negotiations** (3) Teegen
Theories and application in International Business Negotiations (IBN). Formulation of concepts and frameworks; development of systematic approaches to planning for and conducting IBN. Integration of functional, environmental, and institutional contexts facing negotiators internationally.

290 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

298 **Directed Readings and Research** (3) Staff
Supervised readings or research in selected fields within business administration. Admission by prior permission of instructor. May be repeated once for credit.

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

361 **Colloquium on International Business** (3) Staff
Examination of selected topics in international business, with emphasis on major new theoretical and empirical developments.

397 **Doctoral Seminar** (1 to 3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

INTERNATIONAL DEVELOPMENT STUDIES

Program Committee: D.D. Gow (*Director*), J. Brinkerhoff, B. Miller, T. Nagpal, I. Sud, W.F. Waters

Master of Arts in the field of international development studies—The Elliott School of International Affairs offers a multidisciplinary program leading to the Master of Arts in the field of international development studies. The program provides students with a background in international development with a focus upon a discipline or issue.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a demonstrated interest in development.

Required: the general requirements stated under the Elliott School of International Affairs. The program offers a 34-credit-hour option with a thesis or a 40-credit-hour option without a thesis. Students qualify to write a thesis if they meet requirements stated under Thesis Option in the Elliott School section of this Bulletin.

Students in the program take a sequence of four core courses—IAff 211–12 and designated sections of IAff 202 and 290—together as a class. In addition, the program requires one course in each of the following four areas: policy analysis, research methods, management, and economics. The program provides lists of approved courses, drawn from departments and schools across the University, that fulfill this requirement; consult the Elliott School website www.gwu.edu/~elliott.

In consultation with the program director, students propose a program of six courses (18 credits) in a selected issue or discipline. Major issues and disciplines that constitute international development studies include anthropology and development, economic development policy, humanitarian assistance, international business, international development management, international education, international health, natural resources and the environment, and political science. (Subjects may be proposed in addition to those shown here.) Lists of applicable courses are available on the Elliott School website. Students are expected to demonstrate that their proposed program has some intellectual integrity as well as internal logic.

All students must demonstrate oral and reading proficiency in a modern foreign language. Language course credit does not apply toward the degree.

INTERNATIONAL SCIENCE AND TECHNOLOGY POLICY

Program Committee: N.S. Vonortas (*Director*), J.M. Logsdon, R.W. Rycroft, R. Williamson

Master of Arts in the field of international science and technology policy—The Elliott School of International Affairs offers an interdisciplinary program that focuses on interactions among scientific development, technological innovation, and governmental activities, both domestically and internationally. The program is designed to train individuals to understand and manage issues of science and technology policy and strategy.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs. Required: the general requirements stated under the Elliott School. The program consists of 40 credit hours, which includes 3 hours of a research project (IAff 298). Students must successfully complete a policy exercise as part of IAff 229. The two fields are science, technology, and international affairs; and an elective field (a minimum of three courses, which may be in a field offered in another Elliott School program, a field in an academic department, or a field in a specific issue area, such as space policy or economics of technological change). The science, technology, and international affairs field consists of IAff 220, 229, 298, and at least two courses chosen from IAff 221, 222, 223, 224, 225; Econ 255; and approved topics courses taught as IAff 290.

Students must also successfully complete 7 hours of analytical competency. To fulfill this requirement, students may choose between (a) two courses from Econ 217, 218; PAd 264, 296; or other appropriate courses approved by the program director and one Elliott School skills-based course; or (b) one three-credit course listed above and four credit hours of skills-based courses. In instances where proficiency in a foreign language is judged by the program director to be integral to the student's program of study, it may be used to fulfill the analytical competency requirement. However, courses taken to develop language proficiency may not be counted toward the degree.

INTERNATIONAL TRADE AND INVESTMENT POLICY

Program Committee: M. Moore (*Director*), W. Becker, J. Pelzman, S. Rehman, S. Sell

The Elliott School of International Affairs offers a multidisciplinary program leading to the Master of Arts in the field of international trade and investment policy. The program provides a strong background in economics and quantitative methods, a multidisciplinary approach to international economics issues, and preparation for careers in government, the private sector, and nonprofit organizations.

Prerequisite: the admissions requirements stated under the Elliott School of International Affairs. Applicants are strongly advised to take an introductory statistics course and an intermediate microeconomics and macroeconomics sequence before beginning the program.

Required: the general requirements, stated under the Elliott School of International Affairs. The program offers a 34-credit-hour option with a thesis or a 40-credit-hour option without a thesis. Students qualify to write a thesis if they meet requirements stated under Thesis Option in the Elliott School section of this Bulletin.

The student must complete a core field consisting of Econ 283–84, PSc 239, a history course specified by the program director, and a quantitative methods course chosen from Econ 123; Mgt 207, 225; PPol 211; Stat 112, 118, 183. A four-course major field is selected from among the following: international economic analysis, international marketing, international banking and finance. The student should consult the program guidelines available from the Elliott School for the specific courses included in these major fields.

Oral and reading proficiency in a modern foreign language must be demonstrated during the final 18 hours in residence; up to 6 hours of language course credit may be counted toward the degree. The capstone course, offered each spring semester, must be successfully passed.

LANDSCAPE DESIGN

Adjunct Assistant Professor A. Ashkar (*Director*)

The courses listed below lead to the graduate certificate in landscape design, offered by the College of Professional Studies. Information on the program is available at www.

gwu.edu/GWnearyou. Check with the program office for prerequisites to the courses that follow.

Note: For students not enrolled in the graduate certificate program, permission of the program director is required to register for a landscape design course; such students should check with their dean's office to determine whether credit for landscape design courses will apply to their degree.

100 **Landscape Graphics** (1)
Use of drafting equipment and development of graphic and sketching skills. Landscape plans, section, elevation, and axonometric drawing.

102 **Introduction to Plants** (1)
A survey course in plant science: common groups of plants, with a general focus on the structure and function of higher vascular plants.

201 **Introduction to Design** (2)
Design tools for the landscape designer; analysis of existing landscapes; models and research techniques; design project.

202 **Site Analysis** (2)
Inventory and recording of existing site conditions, including slope, soil, microclimate, and context. Base plans, sections, and site programs.

203 **Site Engineering** (2)
Basic site engineering, including grading, drainage, and earthwork; design of steps, ramps, wall, and terraces.

204 **Construction Methods and Materials** (2)
Commonly used materials; design elements such as decks, patios, fences, and walkways.

210–11 **Site Design I–II** (2–2)
Studio course using several small-scale projects to solve a wide range of design problems and resolve conflicts between client requirements and the environmental context.

214–15 **Planting Design I–II** (2–2)
The process of planting design. Plant characteristics, selection, specification, and cost estimates. Cultural requirements and environmental factors.

PSLD 220 through 228 are field courses held at the National Arboretum, offering identification characteristics, design applications, and aesthetic, functional, and cultural aspects of approximately 60 trees, shrubs, vines, and flowering plants for each of the periods specified.

220 **Landscape Plants for Early Fall** (1)

222 **Landscape Plants for Late Fall** (1)

224 **Landscape Plants for Early Spring** (1)

226 **Landscape Plants for Late Spring** (1)

228 **Landscape Plants for Summer** (1)

229 **Herbaceous Plants** (1)
The design use, ecology, and cultural requirements of approximately 100 herbaceous and perennial plants commonly used each season. May be repeated for credit for different seasons.

230 **History of Landscape Design** (2)
Analysis of the built landscape as a physical record of a particular time, revealing influences of culture, politics, geography, natural systems, and precedent.

231 **Contemporary Themes in the Landscape** (1)
Current thinking and trends in shaping the landscape.

240 **Comprehensive Project** (2)
Capstone course. Under the direction of a practicing professional, students prepare a full set of design and working drawings for a selected site.

LATIN AMERICAN AND HEMISPHERIC STUDIES

Program Committee: J. Ferrer (*Director*), C.J. Allen, M. Byrnes, K. Healy, P.F. Klarén, C. McClintock, T. O'Keefe, M. Price, I. Vergara, W. Waters

Master of Arts in the field of Latin American and hemispheric studies—The Elliott School of International Affairs offers a multidisciplinary program leading to the Master of Arts in the field of Latin American and hemispheric studies.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a bachelor's degree in a related field. Required: the general requirements stated under the Elliott School of International Affairs.

The program consists of 40 credit hours of course work. The five-course core includes IAff 286, a multidisciplinary foundation course; IAff 287, the capstone course; and courses on Latin America chosen from designated courses in three of the following disciplinary fields: anthropology, economics, geography, history, and political science. The four-course major field is taken in anthropology; geography; art history, literature, and culture; economics; international business; international health and development; political science; and history. Students should consult program guidelines available from the Elliott School for specific courses in the fields of study.

All students must demonstrate oral and reading proficiency in Spanish or Portuguese by passing a language examination during the final 18 hours in residence. Up to 6 hours of language course credit may count toward the degree.

Students who meet stated requirements may choose to take 34 hours of course work plus 6 hours of thesis research. See Thesis Option under the Elliott School section of this Bulletin.

LEGISLATIVE AFFAIRS

Academic Director C. Cushman

Columbian College of Arts and Sciences, through the Graduate School of Political Management, offers a program leading to the degree of Master of Arts in the field of legislative affairs. This program focuses on the U.S. Congress with emphasis on the legislative process, American political institutions, and public policy analysis.

Master of Arts in the field of legislative affairs—Prerequisite: a bachelor's degree with a *B* average from an accredited college or university.

Required: the general requirements stated under Columbian College of Arts and Sciences. The nonthesis program consists of 33 credit hours of course work; the thesis program consists of 27 hours of course work and 6 of thesis (PSc 299–300). PSc 201 or 203, 218, 222, and 229 are required. The remaining courses are chosen from the following, with at least two courses taken in each of the two groups.

American Political Process: PSc 215, 216, 219, 220, 221, 228, 246, 286; PMgt 267

Public Policy Analysis: PSc 212, 224, 249, 250; PMgt 266; WStu 240

With prior approval of the academic advisor, students may take up to three courses in related disciplines. All students must pass a Master's Comprehensive Examination.

MANAGEMENT SCIENCE

Professors W.E. Halal, E.H. Forman, S.A. Umpleby, E.K. Winslow, J.H. Carson, P.W. Wirtz, E.J. Cherian (*Chair*), J.H. Perry, P.K. Bagchi, J.P. Coyne, R. Soyer, M.J. Granger, J. Bailey, E.G. Carayannis, P.M. Swiercz

Associate Professors T.J. Nagy, R.G. Donnelly, W.H. Money, D.L. Zalkind, J. Artz, L. Williams, S.Y. Prasad, M.M. Tarimcilar, P. McHugh, S. Kanungo, T. Glickman, C. Goldberg, M.A. Gowan, S. Dasgupta, G.T. Solomon

Assistant Professors J. Feinstein, F.T. Anbari, D.F. Cioffi, Y.H. Kwak, R.A. Lumley, T.H. Rosen, S. Serich, P. Weiss, M.M. Hammad, N.M. Brenner, H. Khamooshi, V. Sahasrabudhe, D.C. Kayes, M.D. Haddad, S.C. White, T.M. Nielsen, M.E. Matta

Adjunct Associate Professors C.N. Toftoy

Professorial Lecturers E. Marits, D. Harris, D. Karlgaard, P. Oliver

Associate Professorial Lecturers C.A. Gruel, J. Barker, C.O. Bevis, S.M. Barry-Oliver, C.V. Feudo, J.P. Sagi, M.J. Spina, J.A. Williams

See the School of Business for programs of study leading to the degrees of Master of Business Administration, Master of Science in Information Systems Technology, Master of Science in Project Management, and Doctor of Philosophy.

201 **Organization Management and Leadership** (3) Rosen, Nielsen
Integrative approach to organizational concepts, management principles, philosophy, and theory in public and private organizations. Evolution of management functions, and practices, stressing present management approaches, general systems theory, leadership, and contingency management. For non-M.B.A. students only. (Fall, spring, and summer)

202 **Mathematics and Statistics for Management** (3) Wirtz, Serich, Khamooshi
Mathematical and statistical concepts employed in the solution of managerial problems. Applications of functions, elements of calculus, and linear algebra. Introduction to probability, frequency distributions, statistical inference, and regression and correlation. For non-M.B.A. students only. (Fall, spring, and summer)

206 **Strategic Planning** (3) Halal
Formulation of strategies that enable organizations to adapt to changing social, technological, economic, and political conditions. Lectures, discussion, and exercises examine strategic planning practices and the environmental changes affecting corporations, government agencies, hospitals, and other major institutions. Students conduct a strategic planning project for an organization. (Fall)

207 **Applied Forecasting and Time-Series Analysis for Managers** (3) Soyer
Introduction to various forecasting techniques, including time-series regression models, cyclical trends, exponential smoothing methods, seasonal and nonseasonal ARIMA processes, and the Box–Jenkins approach. Application of forecasting methods in economics, finance, and marketing. Prerequisite: MBAd 220 or permission of instructor. (Spring)

210 **Individual and Group Dynamics in Organizations** (3) Kayes, Bailey
Theoretical, empirical, and practical aspects of individual and group dynamics in organizations. Personal, interpersonal, and cultural aspects of teams and groups. Team structure, process; the role of individual experience and its impact on team learning. (Fall, spring, and summer)

211 **Current Issues in Organizational Behavior** (3) Winslow
Study of behavioral factors relating to issues such as automation, ethics, interpersonal relations, organizational change, and similar problems in organizational settings. Problems of conducting behavioral science research in organizations. (Fall)

212 **Behavioral Factors in the Process of Change** (3) Kayes, Winslow
The human, rather than technical, aspects of change at individual, group, and organizational levels. Core concepts and recent developments in human behavior, learning, and change. Application of theory to practice. (Fall, spring, and summer)

213 **Organizational Factors in the Process of Change** (3) Kayes, Nielsen
Organizational assessment and intervention for managers. Implications of organizational development processes for all areas of the organization. Multiple methods of assessment and intervention are explored. (Fall)

214 **Consultative Processes** (3) Winslow
Theories and methods of planning, introducing, and coping with change in management through the helping process. Intended both for managers seeking an understanding of the consultative approach to planned change and for persons in staff or consultative roles seeking understanding of the consultative process. (Spring)

215 **Conflict Management and Negotiations** (3) Bailey
The nature and sources of conflict and interdependence in social and organizational dynamics. Various means of resolving conflict, including the use of competitive and collaborative negotiations and mediation. Case discussion, exercises, role-playing, and simulation. Managers as mediators and negotiators. Prerequisite: Mgt 210 or permission of instructor. (Fall and spring)

216 **Cross-Cultural Management** (3) Bailey, Umpleby
The cultural foundations of organizations and institutions, with an emphasis on managerial behavior. Cross-cultural differences as they affect work-related behaviors, such as communication, attitude, teamwork, negotiation, and decision making. (Fall, spring, and summer)

220 **Analytical Models for Decision Making** (3) Soyer, Prasad, Tarimcilar
Survey of analytical models for decision making and their applications. Topics include probabilistic, deterministic, and sequential models, single- and multi-attribute utility theory, graphical models, Bayesian inference, forecasting, and concepts from game theory. Prerequisite: MBAd 220 and 231. (Fall and spring)

221 **Purchasing and Materials Management** (3) Bagchi, White
Industrial purchasing and materials management principles and practices. Organization and functions in materials management. Determination of require-

ments, supplier qualifications, source selection, buying practices, policies, and ethics. International purchasing. (Fall and spring)

222 **Logistics Management** (3) Bagchi, White, Matta
Supply chain management in production, service, and public organizations. Analytical tools for planning and establishing operating systems and for their operation, control, and modification. Examination of processes, products, services, equipment, and facilities. Relationships of human systems and operating systems. (Fall)

223 **Manufacturing Control Systems** (3) Bagchi, White
Inventory and production control concepts, techniques, and strategies for effective integration with basic finance, marketing, and manufacturing objectives. Forecasting methods, material requirements planning systems, distribution requirements planning techniques, process control, and classical reorder-point inventory models. (Fall)

224 **Executive Decision Making** (3) Forman, Soyer, Williams, Tarimcilar
Concepts and methods for making complex decisions in both business and government; identifying criteria and alternatives, setting priorities, allocating resources, strategic planning, resolving conflict, and making group decisions. (Fall and spring)

225 **Statistical Modeling and Analysis** (3) Wirtz, Forman, Soyer
The process of specifying, analyzing, and testing models of human and systemic behavior. Formalization of models; statistical test comparison and selection; computer implementation of univariate, bivariate, and multivariate tests. General linear model: linear regression, analysis of variance, and analysis of covariance. Prerequisite: MBAd 220 or equivalent. (Fall and spring)

226 **Workshop in Computerized Decision Systems** (3) Tarimcilar, Prasad, Zalkind, Williams
Framework, processes, and technical components for building decision support systems dealing with unstructured and underspecified problems from managerial and organizational perspectives. Construction and exploration of decision support system models. Prerequisite: Mgt 220 or permission of instructor. (Fall and spring)

227 **Advanced Logistics** (3) Bagchi, White
Modeling approaches in supply chain management; optimization of cost and service. Alternatives available to the manager, given the economic situation, competitive conditions, and regulatory environment of the several transportation modes. Model location theory and logistics network planning and design. Prerequisite: Mgt 222. (Spring)

228 **Operations Strategy** (3) Bagchi, White, Matta
Basic procurement and logistics methods and techniques that influence formulation of a firm's strategic policy. Traditional and updated and improved systems for controlling capacity and output. Examination of productivity analysis, cost control, materials planning, and other topics to ensure that the strategy formulation/operations function contributes to overall profit. (Spring)

229 **Seminar: Management Decision Making** (3) Forman, Soyer, Prasad, Tarimcilar
Advanced topics in management decision making. Topics vary but usually include Bayesian statistics and decision analysis, graphical models, strategic decision making, and business applications of game theory. Prerequisite: Mgt 220, 224, or permission of instructor. (Spring)

230 **Management of Technology Innovation** (3) Donnelly
Competitive, economic, and political factors that influence technology innovation in public and private organizations, domestically and internationally. Management of research and development: project selection, resource allocation, technology planning, management of development projects. Quality, manufacturing, and intellectual property issues. (Fall and spring)

231 **Introduction to Project and Program Management** (3) Hammad, Cioffi, Williams
Practical examination of how projects can be managed from start to finish, including specific emphasis on planning and controlling to avoid common pitfalls. Identifying needs, defining requirements, project costing, scheduling, resource allocation, and project politics. (Fall, spring, and summer)

232 **International Science and Technology** (3) Carayannis
Technology transfer among advanced countries and LDCs. Comparative science and technology policies and capabilities of countries. Technology basis for international trade, licensing, patenting, and joint ventures. Global transfer of military technologies and export controls. Technology in economic development. (Fall, spring, and summer)

233 **Emerging Technologies** (3) Halal
Exploration of new developments in scientific and technological innovation, including automation, energy, medicine, bioengineering, social science, information technology, and space. Emphasis on forecasting these technological advances and assessing their economic and social effects. The role of advancing technology in driving social change. (Spring)

234 **Procurement and Contracting** (3) White and Staff
Principles and concepts essential to effecting large procurement programs. Planning, sourcing, and contractual design for diverse acquisitions. Emphasis on federal government policy with comparison of buying at other governmental levels and the private sector. (Spring)

235 **Technology Entrepreneurship and Innovation** (3) Donnelly
The process of innovation and entrepreneurship used to launch and build new ventures. Organizing for innovation, raising venture capital, tax considerations, managing the small technology-based venture, marketing technology. Case studies of recent low- to high-tech ventures. Developing a business plan for a technology-based venture. (Spring and summer)

236 **Government Contract Administration** (3) Bagchi and Staff
Surveillance and management of contract performance. Measurement of progress; specification interpretation; quality assurance; changes, negotiation, and adjustment; financial considerations; property; terminations; regulatory and policy concerns. (Spring)

237 **Pricing and Negotiation** (3) White and Staff
Scope and objectives of negotiated procurement; preparation, conduct, and recording of negotiations; analysis of cost, price, profit, investment, and risk; cost principles; incentives; relationship of contract type to work requirements; techniques of negotiation. (Fall)

238 **Systems Procurement and Project Management** (3) Bagchi
Major systems acquisition: needs, objectives, organizational relationships, and systems engineering concepts. Design, establishment, and execution of project management plans and procurement processes. Analysis of cases in public- and private-sector contracting. (Fall)

239 **Seminar: Competitiveness and Technology** (3) Donnelly
Capstone course integrating the field of management of science, technology, and innovation. Commercialization of technology in the private sector and the impact on competitiveness. Implementation of technology in the public sector. Technology development, from new product concept to utilization.

240 **Case Studies in Information Systems** (3) Artz, Cherian
Case studies dealing with information systems management and technology. Strategic and management-related issues on information systems development, implementation, and application. Prerequisite: MBAd 221. (Fall and spring)

241 **Information Systems Security** (3) Cherian, Carlson
An advanced course in information technology, emphasizing the philosophies, principles, and practices of security management in and impact of privacy legislation on computer-based systems. Risk assessment, state-of-the-art measures, trends in the information security field, and roles of the various levels of management and technological staff. Prerequisite: M.S.I.S.T. candidacy.

242 **Systems Analysis for Information Systems** (3) Artz, Granger
Development of a specification for an information system. Topics include CASE tools, data gathering, information flow modeling, object-oriented analysis, data file organization, input/output and other nonfunctional requirements. Prerequisite: MBAd 221. (Fall and spring)

243 **Human Factors in Information Systems** (3) Granger
The user–computer interaction, human factors of on-line dialogues, interfacing, and various approaches to user–system interaction. Emphasis on the development and evaluation of user–computer interfaces using software such as Visual BASIC and Windows. (Fall and spring)

244 **Telecommunications: Technology, Applications, and Operations** (3) Feinstein
Basic technical concepts, applications, and trends of telecommunications; operations; cost considerations of implementing telecommunications systems. Prerequisite: MBAd 221. (Spring)

245 **Database Management for Information Systems** (3) Artz, Dasgupta
Theory, architecture, and implementation of database management systems in corporate and organization information systems. Designing databases for business applications and implementing such databases using commercially available packages. Prerequisite: MBAd 221. (Fall and spring)

248 **Data Warehouse Design** (3) Artz
Key concepts in data warehouse design, including measurement of business processes, dimensional modeling, theories of data warehouse development, and methods of exploiting the data warehouse. Differences between relational databases and data warehouses.

249 **Seminar in Hypermedia Information Systems** (3) Coyne and Staff
Current trends in the design and implementation of hypermedia information systems. Integration of database, text, image, voice, video, and knowledge in information systems.

250 **Human Resource Management** (3) Swiercz, Goldberg
Human resource practices in a competitive U.S. economy and in an internationally competitive environment, including labor–management relations. (Fall, spring, and summer)

251 **Total Compensation** (3) Gowan
Comprehensive review of all elements of compensation systems that affect an organization, including wages and salaries, incentives, benefits, perquisites, and intrinsic rewards. (Fall)

252 **Global Human Resource Management** (3) Gowan
International applications of human resource management functions. Selection, preparation, and compensation of U.S. managers and executives for service abroad. Adaptation of human resource management policies to conform to specific cultural environments. (Fall and summer)

253 **Leadership and Executive Development** (3) Swiercz
Theories of managerial leadership; issues and problems associated with leadership in large organizations at higher management levels: executive selection and development. (Fall)

254 **Labor Relations and Negotiations** (3) McHugh, Swiercz
Labor–management relations in both union and nonunion settings. Emphasis on negotiation and conflict resolution, arbitration and grievance procedures, public-sector labor relations, labor laws and public policy, and global labor relations issues. (Spring)

257 **Performance Management and Development** (3) Goldberg
Comprehensive review of performance appraisal and training and development. Students learn to develop customized training programs that relate to the performance appraisal process. (Spring)

258 **Applied Organizational Leadership** (3) Swiercz
In-depth studies of theories of leadership. Legal and ethical obligations of leadership. The leader in the process of assuming responsibility. Experiential exercises designed to develop the students' interpersonal abilities and leadership capacities. (Spring)

259 **Employment Law and Ethics** (3) Swiercz, McHugh
An examination of the interaction of legal requirements and personal ethics and their influence on managerial decisions affecting the employment exchange. Special emphasis on equal employment opportunity and civil rights, workers' compensation, occupational health and safety, collective bargaining, and wrongful discharge. (Fall)

263 **Managing External Projects** (3) Hammad
Fundamentals of contract management from a project manager's perspective. The outsourcing process, associated project strategies, and legal elements. Acquisition planning, vendor selection, contract formulation, and performance control.

264 **System Dynamics Modeling** (3) Umpleby, Kanungo
Computer modeling of organizational problems using system dynamics and the dynamo programming language. Review of previous applications of system dynamics and comparison with other modeling approaches. Causal influence

diagrams, level and rate diagrams, equations, testing, and analysis. Students develop a system dynamics model of some aspect of the organization. (Fall)

265 **International Development for Project Managers** (3) Carayannis
Foundations and methodologies for problem solving in multicultural project environments. Prerequisite: Mgt 202. (Fall, spring, and summer)

266 **Risk Management** (3) Kwak
Basic principles of risk management practices. Developing a risk management plan, including identifying, analyzing, mitigating, and monitoring projects risks. Prerequisite: Mgt 201, 202, 224.

267 **Planning and Scheduling** (3) Cioffi, Khamooshi
Integrated schedule development and control. Schedule analysis, concepts and techniques, including resource allocation, earned value, and reporting process. Prerequisite: Accy 201, Mgt 202. (Fall, spring, and summer)

268 **Project Management Capstone** (3) Cioffi, Kwak, Anbari
Students will be expected to demonstrate integration of the knowledge accumulated in their study plan and apply integrated knowledge and experience to best practices, a project case history, and a handbook. Prerequisite: M.S.P.M. candidacy or permission of instructor. (Fall and spring)

269 **Project Estimation and Cost Management** (3) Anbari
Formalized procedures, tools, and techniques used in developing the project estimate during the planning stages and updating the estimate throughout the project life-cycle; tools and techniques used in monitoring, managing, and controlling the cost of the project. Prerequisite: M.S.P.M. candidacy and Mgt 270. (Fall and spring)

270 **Directed Computational Project Management** (2) Cioffi, Hammad
Practical examination of project management concepts by quantitative application using various software tools. Research in real cost data to support project calculations. Prerequisite: Mgt 231, 267.

271 **Principles of Management Information Systems** (3) Cherian, Money
Overview of all information systems, including integration of management, information, and systems concepts into a unified framework. Management information systems development, design, implementation, and evaluation strategies.

272 **Information Resources Management** (3) Cherian, Williams
An overview of the use of information by organizations and the strategies, policies, and technology used to manage information resources and security. Computer networking and national and international telecommunications are examined within the technical, legal, economic, and social environments of systems operations. Prerequisite: M.S.I.S.T. candidacy.

273 **Electronic Business** (3) Cherian
Overview of electronic commerce/electronic business and interorganizational information systems and their impact on contemporary organizations. Technical, business, security, privacy, legal, e-government, and Internet issues. Prerequisite: Mgt 271 or 282 or MBAd 221. (Fall and spring)

274 **Survey of Advanced Information Technologies** (3) Money
The processes at work in the emergence of new information technologies and techniques for identifying the impacts of these processes. Strategies of technology planning, project selection, and resource allocation.

275 **Advanced Statistical Modeling and Analysis** (3) Wirtz
Advanced topics associated with the general linear model. Testing for and remediation of assumption violations. Detection of outliers, influential observations, and multicollinearity. Alternative design strategies in the analysis of variance; latent growth analysis; hierarchical linear modeling; testing for interactions and parallelism. Prerequisite: Mgt 225 or permission of instructor.

276 **Exploratory and Multivariate Data Analysis** (3) Wirtz
Methods for exploratory and multivariate data analysis. Application and comparison of advanced multivariate analytical procedures. Multivariate and discriminant analysis, LISREL analysis, and canonical correlation. Prerequisite: Mgt 225 or permission of instructor. (Fall)

277 **Human–Computer Interface Design and Evaluation** (3) Nagy, Granger
The development of successful human–computer interfaces depends on integrating theory and practice from many different fields. Students gain direct experience in applying an apt mix of concepts and practices in the context of developing, evaluating, and enhancing an Internet application for a real client. (Fall, spring, and summer)

279 **Data Mining** (3) Prasad, Wirtz
Techniques that can be used to discover relationships in large data sets, including regression models, decision trees, neural networks, clustering, and association analysis.

280 **Information Systems Development and Applications** (3) Artz, Dasgupta
Each stage of the information systems life cycle is discussed in terms of technologies, impact, and management. Topics include structured and object-oriented analysis, prototyping,software reuse, testing, life-cycle costs, software development environments, organizational and behavioral aspects of development projects. Prerequisite: M.S.I.S.T. candidacy or department approval.

282 **Telecommunication and Enterprise Networks** (3) Carson, Feinstein
Telecommunications and networking as applied to enterprises in the commercial and public sector. A survey of the technologies and applications of telecommunications systems with emphasis on LANs and Internet technologies. Selection of technologies and configurations necessary to support business applications. Prerequisite: M.S.I.S.T. candidacy or department approval.

283 **Topics in Higher-Level Languages** (3) Carson, Artz
The structure and organization of high-level languages in relation to the systems development process. Object-oriented design and programming using the JAVA or VB.Net programming language. Programming assignments demonstrate the concepts presented. Prerequisite: M.S.I.S.T. candidacy or department approval.

284 **Database Systems** (3) Artz, Coyne
Use of the latest techniques for developing and implementing an effective database system. Topics include database organization, creation, and maintenance; evaluation criteria; standardization of database systems; and analysis of the state of the art in database development. Prerequisite: M.S.I.S.T. candidacy or department approval.

285 **Database and Intelligent Systems** (3) Coyne, Feinstein
Analysis and solution of complex information problems through commercially available database and intelligent systems; development of evaluation methodology, comparison of implementation strategies. Hands-on experience with major commercial systems. Prerequisite: M.S.I.S.T. candidacy; Mgt 284 or department approval.

286 **Comparative Operating Systems** (3) Artz, Carson
Survey of modern operating systems including Unix, Windows NT, and MVS. Process management, memory management, storage management, scheduling, and security are considered theoretically and as implemented in specific operating systems. Prerequisite: M.S.I.S.T. candidacy or department approval.

287 **Design of On-Line Information Systems** (3) Carson, Money, Weiss
Capstone project course. Analysis, design, and implementation of on-line information systems. Systems analysis, database design, dialog design, response time and reliability calculations, system testing, and project planning. Prerequisite: M.S.I.S.T. candidacy or department approval.

289 **Web-Based Systems Development** (3) Artz, Lumley
The conceptualization, design, and development of business applications using the World Wide Web and emerging technologies. Prerequisite: M.S.I.S.T. candidacy or department approval.

290 **Special Topics** (2 or 3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

291 **Entrepreneurship** (3) Solomon
In exploring the "entrepreneur as a phenomenon," students will be exposed to the theory and experiences associated with entrepreneurs, entrepreneurial acts, and entrepreneurship in all organizational settings—large, small, public, and private. (Fall and spring)

292 **Small-Business Management** (3) Toftoy, Winslow
The start-up process and management of small firms. Field projects involve student teams as consultants to local businesses. Case studies. Emphasis on total customer service, international opportunities, and minority and women's issues.

293 **New Venture Initiation** (3) Toftoy, Carayannis
Essentials of planning a new business venture, sources of financing, evaluation of alternative new business ventures, and analysis of business functions. Creating and analyzing the business plan.

294 **Strategic Entrepreneurship** (3) Toftoy, Winslow
Capstone course for the small business/entrepreneurship concentration. Student teams assist companies in upgrading strategies.

295 **Family Business Strategies** (3) Toftoy
Challenges of managing a family business: risk strategies; successor development and succession planning; stages of family business growth; family motivations and goals. Field projects provide hands-on experience.

296 **New Venture Financing: Due Diligence and Valuation Issues** (3) Staff
Same as Fina 234.

298 **Directed Readings and Research** (3) Staff

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

328 **Special Topics in Decision Making** (3) Soyer
Special topics and advanced applications, such as catastrophe theory, Markovian decision processes, and Bayesian statistics. May be repeated once for credit.

329 **Seminar: Logistics and Operations Management** (3) Bagchi, Perry
Recent developments in production and logistics management; impact of technological economic and social change; significant related trends. Private- and public-sector policy implications. New and emerging analysis techniques. Open only to doctoral students.

333 **Seminar: Management of Science, Technology, and Innovation** (3) Carayannis
For doctoral students. The pedagogy and methodology of field research practices as they pertain to the field of the management of science, technology, and innovation.

340 **Philosophical Issues in Information Systems** (3) Artz
Seminar for doctoral students interested in information systems. Various philosophical traditions and insights from those traditions applied to problems in information systems. (Fall, alternate years)

341 **Advanced Topics in MIS Research** (3) Prasad, Dasgupta
For information systems doctoral students. Seminal papers and leading methods and instruments as applied to MIS research. (Spring, alternate years)

382 **Seminar: Historical Foundations of Organizational Behavior and Development** (3) Kayes, Rosen
The individuals and institutions central to the field of organizational behavior and development. Students read about, meet with, and discuss the work of persons central to the development of the field. Prerequisite: Doctoral candidate status with organizational behavior and development as a major or supporting field, or consent of instructor. (Spring, alternate years)

383 **Field Research in Organizational Settings** (3) Rosen
Applications of field research techniques in formal organizational settings. Examination of the logic of inquiry and techniques of qualitative data collection. Intensive interviewing and participant observation in field settings are emphasized. (Fall)

385 **Special Topics in Research Methods** (3) Wirtz
Research problems and issues related to student dissertations form topics for readings, group discussions, and assigned papers. (Fall and spring)

386 **Seminar: Organizational Behavior and Development Ideas in Progress** (3) Rosen, Winslow
Doctoral students work with a variety of faculty members as they develop new ideas, research projects, and engage in seminal inquiry. The content and structure of the course will depend upon the instructor. Prerequisite: Doctoral candidate status with organizational behavior and development as a major or supporting field, or consent of instructor.

390 **Philosophical Foundations of Administrative Research** (3) Staff
Philosophy of science as applied to research in administration. Topics include the nature and current problems of epistemology, the development and role of theories, and the relationship between theory, methodology, and empirical data. (Fall and spring)

391 **Advanced Problems in Research Methodology** (3) Wirtz, Gowan
Use of models and theoretical frameworks in research; formulation of research questions, hypotheses, operational definitions, research designs, sampling and data analysis approaches. For doctoral candidates who have completed the general examination and all courses and are preparing for their dissertation. (Fall and spring)

397 **Doctoral Seminar** (1 to 3) Staff
Current research and scholarly issues in management science.

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

491 **Introduction to Knowledge and Innovation Management** (3) Halal, Stankosky
The range of factors affecting the knowledge economy, focusing on how organizations leverage their intellectual resources to innovate. The relationship between innovation and knowledge management; the roles of culture, leadership, organizational design, technology, and systems. Same as EMSE 491.

492 **Organizing and Leading Knowledge and Innovation Management** (3) Halal, Rosen
An integrative approach to understanding organizational, managerial, and leadership concepts for knowledge and innovation management. Practices and principles are surveyed for the development, implementation, and maintenance of knowledge and innovation management systems.

494 **Practicum in Knowledge and Innovation Management** (3) Stankosky, Halal
Same as EMSE 494.

MARKETING

Professors S.F. Divita (*Chair*), R.F. Dyer, P.A. Rau, R.S. Achrol, L.M. Maddox, S.S. Hassan
Associate Professors M.L. Liebrenz-Himes, A.K. Smith
Assistant Professor V. Perry

See the School of Business for programs of study in business administration leading to the degrees of Master of Business Administration and Doctor of Philosophy.

Departmental prerequisite: MBAd 230 is prerequisite to all courses in the Marketing Department.

241 **Advanced Marketing Management** (3) Rau
For M.B.A. students in concentrations other than marketing. Case analysis of marketing problems. Current developments in marketing practice. The relationship of marketing to environmental forces and other business functions. (Spring)

242 **Buyer Behavior** (3) Dyer, Hassan, Maddox
The buyer decision process model as a framework for analysis of how and why products and services are purchased and used. The impact of consumer decisions on the marketing strategies of organizations. Marketing applications in high-tech and service industries. (Fall)

243 **Marketing Research** (3) Dyer, Rau
The marketing research process: designing, conducting, and using market research studies. Managing the market research project; qualitative research; survey and experimental designs; data analysis with statistical software packages. Prerequisite: MBAd 220 and 221. (Fall and summer)

246 **Marketing of Services** (3) Liebrenz-Himes, Smith
Management of the activities involved in marketing new and existing services. The innovation system (behavioral and organizational) of service product decisions, product planning processes, marketing auditing, services and the law, and new service trends. Marketing of intangibles and services is highlighted. (Spring)

248 **Advertising and Sales Promotion** (3) Maddox
Examination of advertising and sales promotion from a systems perspective supported by analytical methods and concepts regarding consumer attitudes and behavior. The role of communication in marketing, behavioral research,

message design, economic and financial criteria, development of a promotion program. (Spring)

250 **Selling and Sales Management** (3) Divita
The selling task, with attention to ethical and legal issues, the selling process, nonverbal language, account management, proposal writing, negotiation. Managerial issues, demand analysis and resource allocation, motivation, coaching and incentives, sales administration, and analysis of sales performance. (Fall and spring)

251 **Product Management** (3) Perry, Rau
Examination of all the stages of a product's life, from idea generation through screening, development, and commercialization. Emphasis on new product development. (Spring)

252 **Electronic Marketing and Commerce** (3) Dyer
The impact of technology on sales and marketing strategy. Areas explored include e-branding, customer relationship management, permission e-mail, sales force technology enhancement, mobile commerce, online marketing research, and electronic channels of distributions. (Spring)

253 **Marketing Channels of Distribution** (3) Achrol
Designing and managing channels of distribution. Retailing and wholesaling strategy. Electronic marketing channels: e-Business models and execution. Design of integrated inventory, physical distribution, and logistics systems. Managing channel relations and measuring performance. Regulatory issues in conventional and electronic channels. Global networks. (Fall)

255 **Marketing High Technology** (3) Divita
Emphasis on differentiating the marketing process used for marketing high technology and high technology products from that employed by firms offering a standard product line. Market analysis, product planning, channels of distribution, pricing, promotion, decision making, and developing an integrated marketing plan. Primarily for M.S.I.S.T. students.

257 **Marketing and Public Policy** (3) Divita
Examination of principal areas of public policy formulation affecting marketing practice. Topics: advertising, warranties, product safety, health issues, consumer information systems, informal and formal redress mechanisms, business responsibilities. Government, business, and advocate viewpoints presented.

259 **Marketing Strategy** (3) Divita, Rau
Required capstone course for marketing students. Analysis of complex marketing problems involving policy and operational decisions; emphasis on creative marketing strategy. Prerequisite: completion of at least three Second-Level marketing courses, excluding Mktg 241. (Spring)

290 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

298 **Directed Readings and Research** (3) Staff

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

341 **Seminar: Marketing** (3) Achrol, Dyer, Liebrenz-Himes, Rau, Hassan
Examination of major theoretical developments in marketing. Open only to doctoral candidates.

397 **Doctoral Seminar** (1 to 3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

MASTER OF BUSINESS ADMINISTRATION

The following courses constitute core and integrative requirements for graduate programs in accountancy and business administration. See the School of Business for programs of study leading to the degrees of Master of Accountancy and Master of Business Administration. MBAd courses are taught by faculty members school-wide.

201 **Global Leadership of Business Enterprise** (0 to 2) Staff
A series of required co-curricular workshops, seminars, company site visits, and speaker series. Topics include management communication, team-building and self-assessment, business ethics, cross-cultural communication, career development. Open to full-time M.B.A. students.

205 **Human Dynamics in Organizations** (2) Swiercz, McHugh, Winslow
Integrative approach to organizational concepts, management principles, and the effects of leadership styles and human resource policies and practices on organizational performance in a global and competitive work environment.

210 **Financial Accounting** (2) Singleton, Sheldon, Smith
Same as Accy 201.

211 **Managerial Accounting** (2) Lindahl, Baber, Hansen
Same as Accy 202.

220 **Statistical Analysis for Managers** (2) Soyer, Wirtz, Forman, Zalkind, Tarimcilar, Kanungo
Statistical concepts employed in the solution of managerial problems. Descriptive statistics, frequency distributions, probability, sampling distributions, statistical inference and testing, correlation analysis, regression modeling, analysis of variance. Introduction to forecasting and statistical process control. Statistical software is used for applications.

221 **Information Systems Management** (2) Cherian, Sahasrabudhe
Management information systems, databases and database management, telecommunications, and enterprise networks. Emerging technologies, including information visualization, knowledge management, and virtual reality. Functional information systems, systems life cycle, knowledge-based systems, computer security and control.

230 **Marketing Management** (2) Dyer, Divita, Liebrenz-Himes, Hassan, Maddox, Rau, Smith
Emphasis on the marketing process from the viewpoint of the firm. Market analysis, product planning, channels of distribution, pricing, and promotional decision making; developing an integrated marketing plan.

231 **Operations Management** (2) Forman, Perry, Bagchi, Soyer, Zalkind, Tarimcilar, Kanungo
Fundamentals of operations management and strategic and tactical decision making. Inventory management, resource allocation, production planning, project management, location and transportation analysis, investment planning, queuing systems, equipment selection and maintenance. Technologies for decision modeling. Prerequisite: MBAd 220.

240 **The World Economy** (2) Askari, Rehman, Yang, Teegen, Weiner, Spencer
Key dimensions of the global economy, including international business opportunities and risks. Trade theory and policy, the balance of payments, foreign exchange markets, exchange rate systems and risks, and international payment systems. Foreign direct investment. The changing role of multinational corporations; elements of international corporate strategies. Prerequisite: Econ 220.

250 **Financial Management** (2) Klock, Jabbour, Handorf, Sachlis
Theory, policy, and practice in financial management; financial analysis, sources of funds, investing, capital budgeting and structure, risk analysis, cost of capital, and dividend policy. Prerequisite: Econ 220; MBAd 210, 220.

260 **Business and Public Policy** (2) Englander, Starik, Burke, Griffin
Political, legal, economic, and ethical forces acting on business. Interaction of the market system and public policy process in the development of law and regulation.

270 **Strategy Formulation and Implementation** (3) Davis, Thurman, Cook, Starik, Teng, Burke
An integrative approach to strategic management, stressing formulation, implementation of strategy and policy, and evaluation and control of strategy in various types of organizations. An intramural case competition is required. Prerequisite: Full-time M.B.A. degree candidacy and completion of all other M.B.A. core requirements.

271 **Strategic Management** (2) Davis, Thurman, Cook, Starik, Teng, Burke
An integrative approach to strategic management, stressing formulation, implementation of strategy and policy, and evaluation and control of strategy in var-

ious types of organizations. Prerequisite: Professional M.B.A. degree candidacy and completion of all other core requirements.

295 **Interdisciplinary Projects** (1 to 4) Staff
Project and experiential studies of an interdisciplinary nature involving student teams and faculty from more than one field of study. May be repeated for credit. M.B.A. Program Director approval is required.

298 **Graduate Internship in Business and Management** (0) Staff
Structured practical experience. Permission of instructor required.

MATHEMATICS

Professors H.D. Junghenn, I.I. Glick, M.M. Gupta, E.A. Robinson, F.E. Baginski, D.H. Ullman (*Chair*), J. Przytycki, J. Bonin, V. Harizanov
Associate Professors M. Moses, Y. Rong, W. Schmitt
Assistant Professors L. Abrams, Y. Taylor, I. Yi, K. Gurski

Master of Arts in the field of mathematics—Prerequisite: a bachelor's degree with a major in mathematics from this University, or an equivalent degree.

Required: the general requirements stated under Columbian College of Arts and Sciences. Students must complete 30 credit hours of approved course work in mathematics, with no more than 6 hours of approved 100-level courses, and must pass a comprehensive examination in three subjects selected from algebra, analysis, topology, differential equations, numerical analysis, and linear algebra/advanced calculus.

Master of Science in the field of applied mathematics—Prerequisite: a bachelor's degree with a major in mathematics or a related field such as statistics, a physical science, engineering, or economics.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work is divided between mathematics courses and approved courses from one area of application selected from physics, statistics, computer science, economics, or civil, electrical, mechanical, or systems engineering. Candidates must complete 30 credit hours of approved course work. At least 18 credit hours must be in mathematics courses, with no more than 6 hours of approved 100-level courses. A comprehensive examination must be passed in three subjects selected from algebra, analysis, topology, differential equations, numerical analysis, and linear algebra/advanced calculus.

Doctor of Philosophy in the field of mathematics—Required: the general requirements stated under Columbian College of Arts and Sciences. The General Examination consists of a preliminary examination in three subjects selected from algebra, analysis, topology, differential equations, numerical analysis, and linear algebra/advanced calculus, and a specialty examination in a research area approved by the department. A language examination to demonstrate reading knowledge of mathematics in an approved foreign language is also required.

With permission, some undergraduate courses in the department may be taken for graduate credit (additional course work is required). See the Undergraduate Programs Bulletin for course listings.

201–2 **Algebra I–II** (3–3) Abrams
Group theory including symmetric groups, free abelian groups, finitely generated abelian groups, Sylow theorems, solvable groups. Factorization in commutative rings, rings of polynomials, chain conditions, semisimple rings, Wedderburn–Artin theorems, Galois theory.

203 **Algebra III** (3) Abrams
An extension of the material of Math 201–2, including Frobenius' theorem on associative division algebras, the Hurwitz problem on composition of forms, valuation theory, formally real fields, rings without finiteness conditions, elements of homological algebra with applications.

206 **Topics in Algebra** (3) Abrams, Schmitt
Topics chosen from Lie groups and Lie algebras, non-associative algebras, abelian groups, classical groups, algebraic number theory, representation theory, algebraic geometry, and ring theory. Prerequisite: Math 201–2. May be repeated for credit with permission.

211 **Complex Analysis** (3) Glick, Junghenn
Topology of the complex plane; complex differentiation and integration; Cauchy's theorem and its consequences; Taylor and Laurent series; classifica-

tion of singularities; residue theory; conformal mapping; the Riemann mapping theorem. Prerequisite: Math 139 or equivalent.

214 **Measure and Integration Theory** (3) Glick, Robinson, Yi
Lebesgue measure and integration in abstract spaces. Probability measures. Absolute continuity, the Radon–Nikodym theorem, measures on product spaces, and the Fubini theorem. L^p spaces and their properties. Prerequisite: Math 139 or equivalent.

215 **Introduction to Functional Analysis** (3) Junghenn, Robinson
Topological and metric spaces; Tychonoff theorem; Banach spaces; linear functionals and operators; Hahn–Banach, closed graph, and open-mapping theorems; uniform boundedness; Hilbert spaces; eigenvalues, projections. Prerequisite: Math 214 or equivalent.

216 **Topics in Real and Functional Analysis** (3) Junghenn, Yi
Possible topics include Banach algebras, function algebras, spectral theory for bounded and unbounded operators, harmonic analysis on topological groups and semigroups, topological vector spaces and operator algebras. Prerequisite: permission of instructor. May be repeated for credit with permission.

217 **Ordinary Differential Equations** (3) Glick, Robinson
Existence and uniqueness of solutions, continuity and differentiability of solutions with respect to initial conditions. Properties of linear systems, phase portraits, planar systems and Poincaré–Bendixson theory. Prerequisite: Math 140 and some knowledge of matrix theory.

219 **Partial Differential Equations** (3) Baginski
Classical techniques for the solution of linear partial differential equations. Laplace's equation, Poisson's equation, heat equation, and wave equation. Existence and uniqueness of solutions. Maximum principles. Separation of variables, Fourier series, eigenfunction expansions, and Green's functions. Prerequisite: Math 140 or permission of instructor.

221 **Modern Partial Differential Equations** (3) Baginski
Emphasis on modern theory and analytical techniques applied to the solution of partial differential equations. Topics include Sobolev spaces, generalized solutions, strong solutions and regularity; Sobolev imbedding theorem; Rellich–Kondrachov theorem; Leray–Schauder fixed-point theorems; nonlinear eigenvalue problems. Prerequisite: Math 219 or permission of instructor.

222 **Introduction to Numerical Analysis** (3) Gupta
Computer arithmetic and round-off errors. Solution of linear and nonlinear systems. Interpolation and approximations. Numerical differentiation and integration. Eigenvalues and eigenvectors. Prerequisite: Math 33 and knowledge of a programming language.

223 **Numerical Solution of Ordinary and Partial Differential Equations** (3) Gupta
Initial and boundary value problems for ordinary differential equations. Error propagation, convergence and stability. Finite difference and finite element methods for partial differential equations. Prerequisite: Math 111 and knowledge of a programming language.

225 **Ergodic Theory** (3) Robinson, Yi
Ergodicity, mixing, the K-property and the Bernoulli property. Poincaré recurrence, the Rohlin lemma, the ergodic theorem, and entropy theory. Additional topics from isomorphism theory, spectral theory, the theory of joinings, and coding theory. Prerequisite: Math 214 or permission of instructor.

226 **Dynamical Systems and Chaos** (3) Robinson, Yi
Linear and nonlinear systems, flows, Poincaré maps, structural stability. Examples of chaotic systems in the physical sciences. Local bifurcations, center manifold theory, normal forms, the averaging theorem. Hyperbolic invariant sets, strange attractors, the Smale horseshoe, symbolic dynamics. Prerequisite: Math 124 and 140 or permission of instructor.

231 **Topics in Applied Mathematics** (3) Baginski
Possible topics include, but are not limited to, the calculus of variations, control theory, nonlinear partial differential equations, and mathematical programming. May be repeated for credit with permission.

232 **Topics in Numerical Analysis** (3) Gupta
Numerical methods and software. Introductions to the methods, tools, and ideas of numerical computation. Problem solving using standard mathematical software obtained from the Internet. Interpolation; linear and nonlinear equations.

Differential equations. Prerequisite: Math 111 and 124; knowledge of a programming language.

261 **Combinatorics** (3) Bonin, Schmitt
An introduction to fundamental methods and current research problems in partially ordered sets, enumeration, tableaux, partitions. Prerequisite: undergraduate modern algebra and linear algebra or permission of instructor.

262 **Graph Theory** (3) Bonin, Ullman
Graphical enumeration, factors, planarity and graph coloring, algebraic graph theory, extremal graph theory, applications. Prerequisite: undergraduate modern algebra and linear algebra or permission of instructor.

263 **Topics in Combinatorial Mathematics** (3) Bonin, Ullman, Schmitt
Topics selected from a wide range of research subjects in combinatorics, its relations with other areas of mathematics, and applications. Recent selections have included matroid theory, topological methods in ordered sets, algebraic methods in combinatorics, fractional graph theory, combinatorics of polytopes, the symmetric group. May be repeated for credit with permission.

271 **Mathematical Logic** (3) Harizanov, Moses
Model theory: the relation between a formal language (syntax) and its interpretations (semantics). Consistency, completeness, and compactness. Tarski's theorem on the inexpressibility of truth. Godel's incompleteness theorem and its impact on mathematics.

272 **Topics in Logic** (3) Harizanov, Moses
Topics selected from a broad spectrum of areas of logic and applications, based on students' suggestions and interests. May be repeated for credit with permission.

281 **General Topology** (3) Rong, Przytycki
Topological spaces, bases, open sets and closed sets; continuous maps and homeomorphisms; connectedness and compactness; metric topology, product topology and quotient topology; separation axioms; covering spaces and fundamental groups.

282 **Algebraic Topology** (3) Rong, Przytycki
Fundamental groups and the Van Kampen theorem; simplicial complexes, simplicial homology, and Euler characteristic; singular homology, Mayer–Vietoris sequences. Topics may include cohomology, cup products, and Poincaré duality; classification of surfaces; knots and their fundamental groups. Prerequisite: Math 281 or permission of instructor.

289 **Topics in Topology** (3) Rong, Przytycki, Taylor
Topics may include hyperbolic structures on surfaces and 3-manifolds; knot theory; topology of 3-manifolds; topology of 4-manifolds. Prerequisite: Math 282 or permission of the instructor. May be repeated for credit with permission.

295 **Reading and Research** (arr.) Staff
May be repeated for credit.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

MECHANICAL AND AEROSPACE ENGINEERING

Professors M.K. Myers (*Chair*), R.E. Kaufman, C.M. Gilmore, J.L. Whitesides, C.A. Garris, J.D.-Y. Lee, T. Tong, P.A. Cooper (*Research*), Y.-L. Shen
Associate Professors C. Mavriplis, A.D. Cutler, R. Mittal
Assistant Professors D.F. Chichka, R.R. Vallance, K.-J. Lu
Adjunct Professors B.W. Hannah, P. Matic
Professorial Lecturers J.A. Sprague, C.R. Hauer, S.M. Joshi, J. Juang, I. Raju, J.W. Edwards, G.C. Everstine, A.R. Johnson, J. Sobieski, E.L. Marsh, R.C. Blanchard
Associate Professorial Lecturers T.K. O'Brien, A. Auslander, J.K. Soldner, S.S. Dodbele, J.H. Milgram
Assistant Professorial Lecturer M.A. Busby

See the School of Engineering and Applied Science for programs leading to the master's, professional, and doctoral degrees. A certificate program in computer-integrated design in mechanical and aerospace engineering is offered by the department.

201 **Introduction to Manufacturing** (3) Shen
Fundamentals of modern manufacturing. Processes for manufacturing mechanical and electronic components from metals, polymers, ceramics, and silicon. Manufacturing systems, CAD, robotics, and design for assembly. Current capabilities, technological needs, and competitiveness. Examples from high-tech industries. Prerequisite: approval of department. (Fall)

203 **Experimental Techniques** (3) Cutler, Jones
Sensors; measurement of displacement, temperature, pressure and velocity. Optical methods. Signal conditioning. Computer data acquisition. Uncertainty analysis. Case studies of instrumentation systems such as hot-wire anemometers, laser-doppler anemometers, shlieren/shadowgraph and interferometers. Laboratory projects. (As arranged)

207 **Theory of Elasticity** (3) Lee, Manzari
Introduction to Cartesian tensors; deformation, stress, constitutive relations for linear elasticity; formulation of boundary value problems, variational principles, torsion and bending of prismatial rods, plane problems. Prerequisite: approval of department. Same as CE 221. (Spring)

210 **Continuum Mechanics** (3) Lee
Kinematics of a continuum, equations of motion, linear isotropic elastic solid, Newtonian viscous fluid, integral formulation of general principles, simple applications. Prerequisite: approval of department. (Fall)

220 **Applied Computational Fluid Dynamics** (3) Mavriplis
Basic principles of fluid dynamics and aerodynamics. Finite difference and finite volume methods. Fluid flow and heat transfer analysis of thermo-fluid mechanical systems. Computational aerodynamics codes. Individual hands-on experience with a commercial CFD code such as FLUENT. Prerequisite: approval of department. (Fall)

221 **Fluid Mechanics** (3) Garris, Myers
Continuum, kinematics of fluids; stress and strain rate tensors; fundamental equations of viscous compressible flows. Irrotational flows; sources, sinks, doublets, and vortices. Laminar flow of viscous incompressible fluids; boundary-layer concept. Prerequisite: approval of department. (Fall)

222 **Applied Aerodynamics** (3) Mavriplis
Introduction to practical and computational methods for solving two-dimensional and three-dimensional aerodynamics problems. Linear methods, nonlinear potential methods, coordinate transforms, and boundary-layer methods. Prerequisite: MAE 221, 286. (As arranged)

223 **Turbomachinery** (3) Garris
Turbine, compressor, and pump types and uses; dimensional analysis of turbomachines; cycle analysis of gas and steam turbines; energy interchange in fluid machinery; design, characteristics, and performance of turbines, compressors, and pumps; comparison of types of turbines, compressors, and pumps. Prerequisite: MAE 221. (Fall, odd years)

224 **Viscous Flow** (3) Cutler, Mavriplis
Exact solutions of Navier–Stokes equations; the laminar boundary-layer theory. Reynolds stresses and turbulence; internal, boundary-layer, and mixing flows. Applications to heat and mass transfer and to reacting flows. Prerequisite: ApSc 213, MAE 221, or equivalent. (Fall, even years)

225 **Computational Fluid Dynamics** (3) Mittal, Whitesides
Theory of discrete methods for solving the governing equations of fluid dynamics. Potential flow, Euler equations, Navier-Stokes equations. Emphasis on algorithm development appropriate to modern supercomputers. Prerequisite: MAE 221, 286. (Spring)

226 **Aero/Hydrodynamics** (3) Mittal, Myers
Inviscid flows in two and three dimensions and irrotational flow theory; conformal mapping and applications. Helmoltz theorems and vorticity dynamics. Applications such as airfoil theory, finite wing theory, panel methods, instabilities, free surface flow. Prerequisite: MAE 221 or equivalent. (Spring)

227 **Aeroelasticity** (3) Whitesides
Static and dynamic structural deformations; static aeroelasticity (structural deformation, divergence, control effectiveness, and reversal); dynamic aeroelasticity (flutter, response to gusts and turbulence); unsteady aerodynamics for

2-D wings; strip theory for 3-D lifting surfaces; piston and Newtonian-flow theories. Prerequisite: MAE 221, 257. (As arranged)

228 **Compressible Flow** (3) Cutler, Garris
Thermodynamics and equations of compressible inviscid flow. One-dimensional flow. Isentropic flow. Normal and oblique shock waves. Quasi-one-dimensional flow. Unsteady one-dimensional and steady two-dimensional flow. Introduction to transonic flow. Prerequisite: ApSc 213, MAE 221 or equivalent. (Spring, even years)

229 **Propulsion** (3) Cutler, Garris
Basic concepts of propulsion: energy transformations in propulsive flows, gas dynamics of combustion. Thermal and propulsive efficiencies. Cycle and engine component analysis. Intake, nozzle performance. Drag and thrust generation. Augmentation. Propellers, turbojets, turbofans, ramjets, and rockets. Prerequisite: approval of department. (Spring)

230 **Space Propulsion** (3) Staff
Advanced chemical propulsion: dynamic combustion and instabilities in solid propellants. Injection, atomization, mixing in liquid propellant engine performance. Plasma propulsion: electrostatic, electromagnetic, and electrothermal instabilities (laser and microwave). Nuclear propulsion. Prerequisite: MAE 229. (Spring, even years)

231 **Structure and Transformations in Materials** (3) Gilmore
Structure of crystals, crystal binding, crystal defects, dislocations, solid solutions, phases, diffusion, phase transformations, deformation twinning, and martensite. Prerequisite: ApSc 130. (Fall, odd years)

232 **Fracture Mechanics** (3) Lee
Fundamentals of brittle fracture, Griffith theory and extensions, mechanics of fracture. Linear elastic systems, plasticity considerations, fracture toughness. Engineering analysis, notch-strength analysis with limit approach, crack-propagation laws, fatigue, fracture testing. Prerequisite: approval of department. (Spring, even years)

233 **Mechanics of Composite Materials** (3) Lee, Manzari
Stress-strain relationship for orthotropic materials, invariant properties of an orthotropic lamina, biaxial strength theory for an orthotropic lamina. Mechanics of materials approach to stiffness, elasticity approach to stiffness. Classical lamination theory, strength of laminates. Statistical theory of fatigue damage. Prerequisite: approval of department. Same as CE 223. (Spring, odd years)

234 **Composite Materials** (3) Gilmore
Principles of composites and composite reinforcement. Micromechanics and failure, interface reactions in various composites, reinforcing materials. Structure of composites: fiber-reinforced polymers, filler-reinforced polymers, fiber-reinforced metals, directionally solidified alloys, dispersion-strengthened metals. Prerequisite: approval of department. (Spring, even years)

235 **Deformation and Failure of Materials** (3) Gilmore
Elastic and plastic deformation, yield, dislocation theory, strengthening mechanisms, creep, polymers, fracture, transition temperature, microstructure, fatigue. (Spring, odd years)

236 **Materials Recycling and Recovery** (3) Gilmore
Techniques and technologies for recovering and reusing waste materials. Relationships of recycling and waste reduction to energy conservation and environmental impact; legal, economic, institutional, and environmental policy aspects of recycling and waste reduction. Prerequisite: approval of department. (As arranged)

237 **Applied Electrochemistry** (3) Gilmore
Charged interfaces, principles of electrochemical cells, corrosion thermodynamics, electrode kinetics, general corrosion, crevice corrosion, pitting, stress-corrosion cracking, corrosion protection, batteries and fuel cells, energy storage. Other topics may include current and potential distribution in electrochemical cells and scaling effects in modeling. Prerequisite: approval of department. (Fall, even years)

238 **Introduction to Biomaterials** (3) Gilmore
Fundamentals of materials science and engineering applied to artificial materials in the human body. Topics include biocompatibility, techniques to minimize cor-

rosion or other degradation of implant materials, and the use of artificial materials in various tissues and organs. Prerequisite: Approval of department. (Fall)

240 **Kinematic Synthesis** (3) Kaufman
Techniques for the analysis and synthesis of function, path, and motion generating mechanisms. Methods for the dimensional design of mechanisms. Computer-aided techniques for the optimal design of planar linkages. Review of recent developments and current research. Term project. Prerequisite: MAE 190 or equivalent. (Spring, odd years)

241 **Computer Models of Physical and Engineering Systems** (3) Kaufman
Reduction of physical and engineering systems to simplified physical and mathematical models. Manipulation of models using C/C++ programming. Numerical algorithms for optimization, graph identification, mini-sum arithmetic, and searching. Styles of problem solving. Prerequisite: MAE 117. (Spring)

242 **Advanced Mechanisms** (3) Kaufman
Emphasis on spatial kinematics. Analysis and synthesis of mechanisms. Analytical techniques using matrices, dual numbers, quaternion algebra, finite and instantaneous screws, theory of envelopes. Applications to design of linkages, cams, gears. Use of digital computers in mechanism analysis and design. (Spring, even years)

243 **Advanced Mechanical Engineering Design** (3) Staff
Design of mechanical engineering components and systems emphasizing computer-aided engineering (CAE), including interactive computer graphics, finite element analysis, and design optimization. Creation of a complete design on an engineering workstation. Prerequisite: approval of department. (Fall)

244 **Computer-Integrated Engineering Design** (3) Staff
Design of engineering components and systems on engineering workstations using I-DEAS. Interactive computer graphics, finite element analysis, computer-based design optimization, and other relevant computer-based tools. Students apply design concepts in a computer-aided engineering environment to a selected project. Prerequisite: approval of department. (Spring)

245 **Robotic Systems** (3) Lee
Classification, features, and applications of industrial robots. Spatial descriptions and transformations, forward and inverse kinematics. Jacobian matrix, velocities and static forces, manipulator dynamics and controls. Robot actuators, transmissions, sensors, end effectors, and programming. Prerequisite: MAE 182 or equivalent. (Spring)

246 **Electromechanical Control Systems** (3) Lee
State-space approach to control system analysis and design. Controllability and observability. Optimal stochastic control theory. Introduction to sliding mode control. Applications to robotics and earthquake engineering. Course emphasizes individual hands-on experience with the use of MatLab. Prerequisite: approval of department. (Spring)

247 **Aircraft Design I** (3) Staff
Conceptual design methods used in response to prescribed mission and performance requirements, alternate configuration concepts. Configuration general arrangement and empennage sizing. Estimation of aircraft size, weight, and balance; lift, thrust and drag; system level tradeoff and sensitivity studies. (Spring)

248 **Aircraft Design II** (3) Staff
Preliminary design methods used to refine a conceptual aircraft configuration. Area ruling, computer-aided design methods and structural arrangement, estimation of aircraft static and dynamic stability and control sizing, inlet design, detailed tradeoff and sensitivity studies, economic and reliability considerations. (Spring)

249 **Spacecraft Design** (3) Staff
Computer-aided design of spacecraft and satellites to meet specific mission requirements. Environment, propulsion, structure, heat transfer, orbital mechanics, control considerations. Use of modern computer codes for design studies. Prerequisite: approval of department. (Fall)

250 **Launch Vehicle Design** (3) Staff
Computer-aided design of hypersonic launch vehicles to meet specific mission requirements. Propulsion, structures, flight path, aerothermochemistry, control

considerations. Use of modern computer codes for design studies. Prerequisite: approval of department. (Spring, odd years)

251 **Computer-Integrated Manufacturing** (3) Shen
Automation techniques for processing metals, polymers, and composites. Use of sensing and process modeling in process control. Numerical control and robot applications and limitations. Integration, scheduling, and tool management in the computer-integrated factory. Quality control. Social and economic considerations in CIM. Prerequisite: MAE 192 or equivalent. (Spring)

252 **Projects in Computer-Integrated Design and Manufacturing** (3) Shen
Applications of the concepts of computer-integrated manufacturing to group projects, culminating in written and oral presentations. Robot programming, vision-guided assembly, force sensing, fixturing, and end-effector design for practical applications. Factory simulation, part scheduling, and NC program-verification algorithms. Prerequisite: MAE 251. (Fall, odd years)

253 **Aircraft Structures** (3) Staff
Statics of thin-walled beams and panels, force interplay between stiffeners and skin in the analysis and design of stiffened thin-walled structures. Strength and stiffness of locally buckled stiffened structures. Design considerations. Critical evaluation of various design procedures. Prerequisite: approval of department. (As arranged)

257 **Theory of Vibrations** (3) Lee
Damped and undamped natural vibration, response of single- and multiple-degrees-of-freedom systems to steady-state and transient excitations, modal analysis, nonproportional damping and complex modes, variation formulation of equations of motion, discretization of structural systems for vibrational analysis. Prerequisite: approval of department. (Fall)

259 **Solar Heating Systems** (3) Staff
Methods of solar energy collection and storage. Theory of flat-plate collectors, solar energy system analysis, design of solar water-heating and space-heating systems, economics of solar heating systems. Passive solar heating systems. Solar industrial process heat. Prerequisite: MAE 187 or equivalent. (Fall, odd years)

260 **Heating and Air-Conditioning of Buildings** (3) Staff
Heating and cooling load calculations, system design and energy consumption analysis. Codes and standards for building energy management, energy conservation. Heating and air-conditioning systems; central-control systems. Cost estimates. Prerequisite: MAE 187 or equivalent. (Spring, odd years)

261 **Air Pollution** (3) Staff
Introductory course on the generation, monitoring, and control of air pollution. Atmospheric pollutants; current levels and health problems. Combustion chemistry and mixing. Photochemical processes; smog and measurements. Atmospheric dispersion; inversion and acid rain. Prerequisite: approval of department. (Fall, odd years)

262 **Energy Systems Analysis** (3) Staff
Analysis of energy resources and conversion devices. Statistical data analysis, forecasting, I/O, and net energy analyses, mathematical modeling. Prerequisite: approval of department. (Fall)

270 **Theoretical Acoustics** (3) Myers
Basic acoustic theory in stationary and uniformly moving media; waves in infinite space; sound transmission through interfaces; sound radiation from simple solid boundaries, source and dipole fields; propagation in ducts and enclosures; elements of classical absorption of sound. Prerequisite: ApSc 213, MAE 221. (As arranged)

271 **Time Series Analysis** (3) Myers
Harmonic analysis of random signals; auto- and cross-correlations and spectra; coherence; modern techniques for spectral estimation, including fast Fourier transform, maximum entropy, and maximum likelihood; bias and variability; randomly sampled data; digital filtering; applications. Prerequisite: approval of department. (As arranged)

273 **Principles of Automatic Flight Control** (3) Staff
Design of aeronautical instrumentation and feedback controls; mathematical models of sensors, controllers, and actuators; theory of feedback control, stabil-

ity, accuracy, and speed of response; equalization effects of nonlinearities and noise. Prerequisite: approval of department. (Spring)

274 **Spacecraft Dynamics** (3) Chichka
Fundamentals of satellite attitude dynamics and passive stabilization. Spacecraft attitude representation, rotational kinematics and kinetics. External torques. Dynamics of gyroscopes. Gravity gradient stabilization. Effect of internal energy dissipation on stability of spinning bodies and methods of despin. Dual spin satellites. Prerequisite: approval of department. (Spring, even years)

275 **Stability and Control of Aircraft** (3) Klein
Derivation of equations of motion, Euler transformations and direction cosines, stability derivatives and linearization of equations of motion, stability of linear systems with application to longitudinal and lateral dynamics, Laplace transform techniques, and frequency-response analysis. Prerequisite: approval of department. (Fall, even years)

276 **Space Flight Mechanics** (3) Chichka
Coordinate and time systems. Newton's laws; 2-, 3-, and n-body problems, Lagrange points, gravity assisted trajectories, variation of parameters and orbit perturbations, non-central gravity effects, drag, sun-synchronous, and formation orbits. Numerical applications using MatLab. Prerequisite: approval of department. (Fall)

277 **Spacecraft Attitude Control** (3) Staff
Control of spinning and three-axis stabilized spacecraft. Elements of linear control theory for single-input, single-output systems and basic feedback control laws. Momentum management and actuator desaturation. Sensors for attitude determination. Application of modern control for multi-input, multi-output systems. Control system simulations using MatLab. (As arranged)

278 **Space Flight Guidance and Navigation** (3) Staff
Fundamentals of spacecraft guidance and navigation. Single, double, and multi-impulse orbit changes, Lambert's Theorem, rendezvous and interception, batch and sequential orbit determination, guidance strategies for fixed and variable flight time problems. Numerical applications using MatLab. (Fall, even years)

280 **Intermediate Thermodynamics** (3) Staff
Review of First and Second Laws of Thermodynamics and combining the two through exergy; entropy generation minimization and applications. Single phase systems, exergy analyses, multiphase systems, phase diagrams and the corresponding states principle. Prerequisite: approval of department. (Fall)

281 **Advanced Thermodynamics** (3) Staff
Development of classical and quantum statistical mechanics, including Maxwell–Boltzman distributions and microscopic origins of entropy and other thermodynamic variables. Partition functions and micro- and grand-canonical ensembles; Fermi–Dirac, Bose–Einstein, and intermediate statistics. Einstein and Debye models of solids. Prerequisite: MAE 280 or equivalent. (As arranged)

282 **Convective Heat and Mass Transfer** (3) Cutler, Garris
Heat and momentum transfer in laminar and turbulent flow. The laminar boundary-layer solution. Similarity and nondimensional parameters. Mass-momentum heat transfer analogy. Convective heat transfer at high velocity. Stability, transition, and turbulence. Free convection. Prerequisite: MAE 221 or equivalent. (Spring, odd years)

283 **Radiative Heat Transfer** (3) Cutler, Skelton
Basic concepts of heat transfer by thermal radiation starting from Planck's equation for blackbody radiation. Realistic engineering problems are addressed, some involving radiative heat transfer with a variety of surfaces, geometries, and enclosures. Radiative heat flow combined with conduction and convection boundaries. Prerequisite: approval of department. (Fall, odd years)

284 **Combustion** (3) Garris
Basic combustion phenomena. Rate processes and chemical kinetics. Chain reaction theory. Detonation, deflagration, diffusion flames, heterogeneous combustion. Experimental measurements. Impact of pollution regulations and alternate fuels. Prerequisite: approval of department. (Spring, even years)

286 **Numerical Solution Techniques in Mechanical and Aerospace Engineering** (3) Staff
Development of finite difference and finite element techniques for solving elliptic, parabolic, and hyperbolic partial differential equations. Prerequisite: ApSc 213 or equivalent. (Fall)

287 **Applied Finite Element Methods** (3) Lee
Basic aspects of theory and application of finite element methods. Utilization of MSC/NASTRAN for static, dynamic, linear, and nonlinear analyses of problems in mechanical, aeronautical, and astronautical engineering. Course emphasizes individual hands-on experience with the MSC/NASTRAN code. Prerequisite: approval of department. (Fall)

288 **Advanced Finite Element Analysis** (3) Lee, Manzari
Review of variational formulation of the finite element method. Formulation of various continuum and structural elements. Application to static and dynamic problems in elasticity, plasticity, large deflection, and instability in plates and shells. Recent developments in finite element methods. Same as CE 228. Prerequisite: MAE 210, 286; or CE 220, 227. (Spring, even years)

290 **Special Topics in Materials Science** (3) Staff
Selected subjects of current interest. Arranged by consultation between department faculty and students. Typical topics include experimental methods in materials science and nondestructive inspection of materials. Prerequisite: approval of department. (As arranged)

291 **Special Topics in Mechanical Engineering** (3) Staff
Selected subjects of current interest. Arranged by consultation between department faculty and students.Typical topics include tribology, power systems design, and plasticity theory. Prerequisite: approval of department. (As arranged)

292 **Special Topics in Aerospace Engineering** (3) Staff
Selected subjects of current interest. Arranged by consultation between department faculty and students. Typical topics include environmental noise control, aeroacoustics, hypersonic flow, and flight vehicle aerodynamics. May be repeated for credit. Prerequisite: approval of department. (As arranged)

298 **Research** (arr.) Staff
Basic research projects as arranged. May be repeated for credit.

299-300 **Thesis Research** (3-3) Staff

350 **Advanced Topics in Materials Science** (3) Staff
Topics such as surface science that are of current research interest. Selected after consultation between department faculty and students. Prerequisite: approval of department. (As arranged)

351 **Advanced Topics in Mechanical Engineering** (3) Staff
Topics such as advanced analytical mechanics, advanced mechanics of continua, and advanced theory of elasticity that are of current research interest. Selected after consultation between department faculty and students. Prerequisite: approval of department. (As arranged)

352 **Advanced Topics in Aerospace Engineering** (3) Staff
Topics such as nonsteady flow, physical gas dynamics, turbulence, and nonlinear wave propagation that are of current research interest. Selected after consultation between department faculty and students. Prerequisite: approval of department. (As arranged)

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Science qualifying examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Science candidates. May be repeated for credit.

MEDIA AND PUBLIC AFFAIRS

Professors C.H. Sterling, J.B. Manheim, J.L. Folkerts, C. Stern, S.V. Roberts, S. Hess
Associate Professors J.E. Thiel, J.E. Steele, S.L. Livingston (*Interim Director*), L.S. Harvey, A.L. May III, L. Willnat, M. Feldstein, P.F. Phalen
Assistant Professors S. Keller, P.C. O'Brien, S. Aday, K.A. Gross

Master of Arts in the field of media and public affairs—Prerequisite: An undergraduate degree in mass or political communication, journalism, electronic media, or a related program.

Required: the general requirements stated under Columbian College of Arts and Sciences and completion of 36 credit hours, including SMPA 201, 202, 210, 240, and 241; 6 credit hours outside SMPA as approved by the advisor; 9 credit hours of SMPA topic courses or related credits outside SMPA as approved by the advisor; 6 hours of thesis

research or additional course work approved by the advisor. A written comprehensive examination must be passed after completion of the five required SMPA courses.

With permission of the director of graduate studies, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Media Processes and Institutions** (3) Sterling, Phalen
Analysis of the interactions among media organizations, societal institutions, and citizens in a democracy. How economic pressures, audience behavior, history, and technology shape the content and character of American mass media. (Fall)

202 **Media Theory and Effects** (3) Willnat, Aday
Survey of media effects research. Focus on the individual attitudinal, affective, and cognitive effects resulting from media exposures of various types and on other institutional, social, and cultural effects. (Fall)

210 **Media and Public Affairs** (3) Livingston, Manheim, Gross
Examination of the influence of media in the shaping and conduct of public affairs. Topics include politics of news making, political uses of media content, role of media in shaping dialogue on public issues, and theoretical basis of strategic communication. (Spring)

240 **Qualitative Media Research Methods** (3) Staff
Qualitative research methods and conceptual approaches to studying media, including case studies, history, biography, interviewing, ethnography, participant observation, and fieldwork. Sources and databases and other archival collections. Various social, cultural, and historical approaches to media analysis. (Spring)

241 **Quantitative Media Research Methods** (3) Manheim, Willnat
Design, applications, and limitations of quantitative research as applied to the field of media and public affairs. Framing of research questions, identification of variables and formulation of hypotheses, measurement, sampling, data gathering techniques, data analysis, and preparation of research reports. Prerequisite: an undergraduate statistics course. (Fall)

250 **Topics in Media Processes and Institutions** (3) Steele, Sterling, Phalen
Topics address such issues as the history of media content, institutions, and process; impact of changing communications technology on culture; history and development of mass-produced culture in the United States; and professional ideology and practice of journalism. May be repeated for credit provided the topic differs. Prerequisite: SMPA 201.

260 **Topics in Theory and Effects** (3) Willnat, Aday
Topics address such issues as the relationship between broadcast content and the construction of social perceptions; anthropology of media; and viewership, readership, and the changing American audience. Prerequisite: SMPA 202.

270 **Topics in Media and Public Affairs** (3) Livingston, Manheim, Gross
Topics explore such areas as social theories of public opinion and mass media's response; effects of global news media on conduct of U.S. foreign and military policy; and the role of mass media in constructing social perceptions of the scientific process and its relationship to cultural and material life. Prerequisite: SMPA 210.

280 **Topics in Research** (3) Staff
Courses under this topic examine advanced research methods used in the study of media effects, history, law, and policy. May be repeated for credit with departmental approval. Prerequisite: SMPA 240, 241.

296 **Directed Readings and Research** (3) Staff
Independent research with SMPA faculty member. Must be approved in advance by supervising professor and director of graduate studies. May be repeated for credit with departmental approval.

297 **Field Experience** (1 to 3) Staff
Students spend 12–20 hours per week in an approved position. Outside reading and/or research under the supervision of an SMPA faculty member. Grades are credit only. May be repeated for credit with departmental approval.

298 **Independent Study** (1 to 3) Staff
Independent research project conducted with a faculty advisor. Must be approved by director of graduate studies.

299–300 **Thesis Research** (3–3)

MICROBIOLOGY AND TROPICAL MEDICINE

The Department of Microbiology and Tropical Medicine offers the courses listed below in support of basic science programs offered by Columbian College of Arts and Sciences. The Department participates in the Master of Science in the field of genomics and bioinformatics offered by Columbian College of Arts and Sciences in cooperation with the School of Medicine and Health Sciences and the School of Engineering and Applied Science.

201 **Interdisciplinary Medical Microbiology** (5)
Provides an interdisciplinary approach to the study of infectious organisms and associated diseases by combining aspects of fundamental microbiology, infectious disease, pharmacology, and pathology.

220 **Biology of Parasitism: Parasite Strategies of Infection, Survival, and Transmission** (2)
A comprehensive course examining the strategies parasites use to infect their hosts, how they survive and thrive within their host, and the developmental adaptations they use to ensure transmission of their offspring to the next host. Prerequisite: BiSc 139 or permission of instructor.

229 **Immunobiology of Infections** (2)
The immunobiology of parasite infections in humans and animal models of disease with a focus on host/parasite interactions during immune stimulation vs. immune evasion.

233 **Virology** (3)
Biochemical, genetic, and pathogenic characterization of viruses. Prerequisite: Bioc 221–22 or permission of instructor. (Spring)

235 **Human and Transforming Viruses** (3)
Current concepts of transformation and disease caused by RNA and DNA viruses. Prerequisite: Micr 233. (Fall)

236–37 **Fundamentals of Genomics and Proteomics** (2–2)
Same as Bioc 236–37.

250 **Applied Bioinformatics** (2)
Bioinformatics tools available for DNA/RNA and protein sequence analysis, structural analysis, and data mining.

292 **Tropical Infectious Diseases** (2)
Lecture course. Pathogenesis, natural history, and epidemiology of the major infectious diseases that occur in developing countries.

293 **Special Topics** (arr.)
Selected topics in microbiology. May be repeated for credit provided the topic differs.

MOLECULAR AND CELLULAR ONCOLOGY

S.R. Patierno (*Director*), J.D. Ahlgren, M.L. Avantaggiati, P. Berg, B. Bouscarel, S. Ceryak, A.M. Colberg-Poley, E.C. DeFabo, L. DePalma, A.L. Goldstein, C.C. Haudenschild, R. Hawley, V. Hu, F. Kashanchi, A.D. Keegan, J.K. Kelleher, K.A. Kennedy, A. Kumar, S.K. Ladisch, P.S. Latham, H.G. Mandel, M.J. Manyak, G. Merlino, F.P. Noonan, J.M. Orenstein, J. Quackenbusch, J.M. Rosenstein, D. Scott, R.S. Siegel, D. Stephan, M.A. Stepp, M. Sutherland, J.A. Winkles, X. Zhan

Doctor of Philosophy in the field of molecular and cellular oncology—Prerequisite: A bachelor's degree in chemistry, biological sciences, or an approved related field.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work must include the biomedical sciences core curriculum and Onco 221, 222, 224. Courses related to molecular and cellular oncology that may be included in the program include: Anat 260; Bioc 234, 250, 251, 252, 270; BiSc 227, 229, 230, 274, 275; E&RP 210; Gnet 256; Micr 229, 233, 258; Phar 240, 242.

Research fields: Chemical, viral, nutritional, UV light, and radiation carcinogenesis; tumor cell biology and metabolism; gene regulation; oncogenes and tumor suppressor genes; growth factors; chemotherapy and mechanisms of resistance; radiotherapy; immunotherapy; immunology of bone marrow transplant; development of immunological and molecular markers for diagnosis and detection; tumor immunology; epidemiology and prevention; cancer and AIDS; mechanisms of metastasis; transgenic models of cancer.

221 **The Basic Science of Oncology** (3)
Epidemiology, genetics, viruses, oncogenes, chemical carcinogenesis, radiation carcinogenesis, tumor growth, metastasis, biochemistry of cancer cells, tumor markers, hormones and cancer, cancer immunobiology, radiotherapy, chemotherapy and immunotherapy. (Fall)

222 **Molecular Oncology** (2)
Seminar course dealing with molecular basis for the topics introduced in Onco 221. (Spring)

224 **Research Seminar** (2)
Forum for students to present their research findings before fellow students and program faculty for critical evaluation. Admission by permission of instructor.

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

MUSEUM STUDIES

Committee on Museum Studies
I.P. DeAngelis (*Director*), B. Craig, M. Morris, K. Rice, J. Vlach, A. Zimmerman

Columbian College of Arts and Sciences offers an interdepartmental program leading to the degree of Master of Arts in the field of museum studies. The program is designed for those who seek a deepening of their primary academic interest along with training in the broad range of talents required in the successful operation of museums. The goal of the program is to produce graduates who are prepared to assume museum positions that require both scholarship and functional skills. (Students whose career interests are primarily curatorial should consider applying for the Master of Arts in their academic discipline with a concentration in museum training; those interested in museum education should refer to the Master of Arts in Teaching under the Graduate School of Education and Human Development.)

Students applying for candidacy in the Museum Studies Program must meet all general requirements for admission to Columbian College of Arts and Sciences. The student must have an undergraduate major, or its equivalent, relevant to the proposed academic core and must be able to demonstrate a sufficient breadth of academic preparation to support the proposed graduate course of study. Prior museum training is not a requirement.

In preparing the academic core portion of the program of study, students draw on courses offered by the appropriate academic departments. Courses that pertain to the museum studies portion of the program are described below and are supplemented by additional courses offered by other departments, such as American Studies, Anthropology, Educational Leadership, Fine Arts and Art History, and Theatre and Dance.

Master of Arts in the field of museum studies—Required: the general requirements stated under Columbian College of Arts and Sciences. The degree requires a minimum of 42 hours of course work, including MStd 202 and 215. At least 15 hours of course work must be in an academic core discipline, such as American studies, anthropology, biological sciences, geology and hominid paleobiology, history, or an appropriate interdisciplinary combination. A concentration in art history is possible only in the Department of Fine Arts and Art History. At least 15 hours of course work must be in museum studies courses that concern such functions as museum administration, collections management, exhibiting, and object care and conservation. At least 6 hours must be in museum internships in the Washington area or elsewhere. The student must pass a comprehensive examination based on course work and submit a research paper.

The Museum Studies Program offers a certificate program for international museum professionals who wish to study museum administration, collections management, or exhibition development in the United States. The program is also available to U.S. students who hold at least a master's degree in an appropriate academic subject. Information on the certificate program can be obtained from the Museum Studies Program.

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201 **Introduction to Museum Studies: History and Philosophy of Museums** (3)
Museums viewed from historical, philosophical, and practical perspectives. Examination and comparison of types of collecting organizations. Analysis of contemporary studies on the status of museums and their public programs. (Fall)

202 **Introduction to Museum Studies: Administration** (3) Morris
Overall operation of the museum: legal status of the museum and its obligations to the public; governance, staffing, policymaking as a nonprofit organization. Theory applied to practical situations. (Fall and spring)

203 **Fiscal Management of Nonprofit Organizations** (3) Staff
Basic concepts of general accounting; fund accounting for nonprofit organizations; budgets and budget systems; use of the budget as a management tool; long-range planning; income sources; other financial management concepts. (Spring)

215 **Collections Management: Legal and Ethical Issues** (3) DeAngelis
Establishing collections policies; laws, regulations, conventions, and codes that affect acquisitions, deaccessions, loans, and collection care; accountability; access problems. (Fall)

216 **Collections Management: Practical Applications** (3) Staff
The implementation of collections policies: establishing and managing collections, management procedures and systems, documentation of collections, records preservation, collections access and storage, handling, packing and shipping, and inventory control. (Spring)

232 **Museum Preventive Conservation I** (3) Staff
Historical development of preventive conservation in museums, conservation ethics, team approaches to conservation, interactions of various materials with agents of deterioration. Basics of materials testing, preparation of condition reports, choosing museum storage and exhibition materials, and risk assessment. Same as Anth/AH 232.

233 **Museum Preventive Conservation II** (3) Staff
Practical applications of preventive conservation of materials, monitoring environmental conditions, conducting risk assessments, evaluation of exhibit and storage areas; developing plans, policies, and procedures for collections care; grant proposal preparation for collections care initiatives. Same as Anth/AH 233.

270 **Museum Exhibition: Curatorial Research and Planning** (3) Rice
Museum research from a curatorial point of view, with emphasis on exhibit theory and practice. Research techniques, information sources, script production. May be repeated for credit. (Fall and spring)

271 **Museum Exhibition: Design Processes** (3 or 6) Staff
The processes of research, conceptualization, planning, and evaluation from a designer's point of view. Focus is on individual projects with some group collaboration. The designer's vocabulary, visual thinking, design documentation, and specifications. (Fall and spring)

287 **Museums and Technology** (3) Staff
Same as Educ 287.

291 **Museum Internship** (1 to 6) DeAngelis
Individual work experience in museums of the Washington area and possibly elsewhere. Each student should make arrangements with the Museum Studies Program staff. Museum internships are supervised by one or more members of the cooperating museum staff in the areas of museum management, object care and conservation, exhibiting. (Fall, spring, and summer)

295 **Directed Research** (3) Staff
Individual research on special topics in the museum field. Topics must be approved by the director of the Museum Studies Program. May be repeated for credit. (Fall, spring, and summer)

297 **Special Topics** (3) Staff
May be repeated for credit provided the topic differs.

NEUROSCIENCE

T.G. Hales (*Director*), J. Battey, M. Batshaw, M. Bell, V.A. Chiappinelli, A. Chiaramello, S. Dopkins, C. Fraser, V. Gallo, E. Hoffman, E. Kirkness, J.M. Krum, D. Lawrence, C.W. Linebaugh, D. Mendelowitz, S.A. Moody, T.W. Moody, J. Natale, J. Neiderhiser, R. Oakley, D.C. Perry, K.D. Peusner, J. Philbeck, D. Reiss, J.M. Rosenstein, L.A. Rothblat, M. Sandqvist, S.J. Schiff, E.M. Sorenson, D. Strickland, M.L. Sutherland, L.L. Werling

Doctor of Philosophy in the field of neuroscience—Prerequisite: A bachelor's degree in chemistry, biological sciences, or an approved related field.

Required: the general requirements stated under Columbian College of Arts and Sciences. Course work must include the biomedical sciences core curriculum, with NeuS 292, 294, and two of the following: Anat 212, 253; NeuS 285; Phar 280. Electives may include Bioc 250; BiSc 249, 274, 275; Psyc 268 or 281.

Research fields: cerebral ischemia, neural transplantation, molecular mechanisms of action of drugs of abuse, neurotransmitter systems, neuropeptides, developmental neurobiology, psychobiology of learning and memory, function of ion channels, receptors, and transporters.

285 **Neurophysiology** (3)
Basic principles of electrophysiology and electrophysiological techniques.

292 **Seminar** (1)
Research reports and discussions by guest lecturers, faculty, and students. May be repeated once for credit.

294 **Current Topics in Neuroscience** (1)
Presentations and discussion on current topics based on journal publications.

296 **Advanced Studies** (1)
Presentation and discussion of research by invited speakers. A different area of neurobiology will be studied each semester.

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

ORGANIZATIONAL SCIENCES

Professors C. Warren, L. Offermann
Associate Professors E.B. Davis, G.E. Dehler, D.P. Costanza (*Chair*), G. Selby
Assistant Professors J.C. Miller, N. Olsen, N. Vasilopoulos, A.J. Critchfield, G. Debebe, T. Dumas
Professorial Lecturers R. Sadacca, S. Wehrenberg
Associate Professorial Lecturers J. Brock, D. Koehn, W.E. Smith
Assistant Professorial Lecturers L. Nabors, M.A. New

The newly established Department of Organizational Sciences and Communication offers interdisciplinary programs leading to the degree of Master of Arts in the fields of human resources management and organizational management. The programs have been designed for public, private, and nonprofit sector professionals who wish to increase their managerial competence, enhance their leadership ability, and improve their career potential. The curricula provide knowledge and skills in the social and behavioral sciences. In addition, graduate certificates in leadership coaching and in organizational management are offered.

Master of Arts in the field of human resources management—Prerequisite: a bachelor's degree with a *B* average from an accredited college or university.

Required: the general requirements stated under Columbian College of Arts and Sciences, including 36 credit hours of course work. There is no thesis requirement. All students must pass a Master's Comprehensive Examination. The following courses are required: OrSc 209, 212, 214, 222, 223, 248; Econ 219; Psyc 245; Stat 104.

Master of Arts in the field of organizational management—Prerequisite: a bachelor's degree with a *B* average from an accredited college or university.

Required: the general requirements stated under Columbian College of Arts and Sciences, including 36 credit hours of course work. There is no thesis requirement. All students must pass a Master's Comprehensive Examination. The following courses are required: OrSc 209, 216, 241, 242, 243; Econ 219; Psyc 245, 259; Stat 104.

The Doctor of Philosophy in the field of psychology with a concentration in industrial/organizational psychology is offered through the Department of Organizational Sciences and Communication. For requirements, see Psychology.

201 **Principles of Management Information Systems** (3)
An overview of the management information systems specialty track. Integration of management, information, and systems concepts into a unified framework. Management information systems development, design, implementation, and evaluation strategies.

209 **Management Systems** (3)
An overview of theoretical frameworks, evolution, concepts, and methods of complex organizational systems. Modern organization theory using systems thinking and concepts. Organizational and management systems paradigm shifts. Problem solving and decision making, stakeholder theory, organizational environments, organizational effectiveness.

212 **Current Issues in Personnel Testing and Selection** (3)
Psychometric, legal, and organizational issues in personnel employment testing and selection, reliability and validity of selection instruments, and the utility of selection systems. The legal environment, including test fairness in selection, adverse impact, and statistical models of test fairness and specific selection techniques. Prerequisite: Stat 104.

214 **Personnel Training and Performance Appraisal Systems** (3)
Management training programs and training evaluation techniques. Performance appraisal techniques, appraisal systems, relationship of rewards to performance and the appraisal interview. Training and rating systems that satisfy legal requirements and stimulate employee productivity.

216 **Theories and Management of Planned Change** (3)
A systems view of organizational change and development, including intervention strategies, data collection, diagnosis, and the integration and management of system-wide organizational change.

217 **Productivity and Human Performance** (3)
Definitions and measurement of individual, team, and organizational productivity, effectiveness, and efficiency. Models for the analysis of organizational and individual productivity and productivity growth in industrialized nations. Techniques for increasing productivity.

222 **Theory and Practice of Compensation Management** (3)
Analysis of contemporary compensation systems from both theoretical and practical perspectives, including the latest decisions of courts and regulatory agencies. Examination of motivational theories of pay, determinants and effects of salary structures on performance, incentive plans, performance-based compensation, and managerial compensation systems.

223 **Collective Bargaining** (3)
Analysis of federal and state employee relations laws and regulations. Topics include the bargaining environment, wage and benefit issues in arbitration, arbitration of grievances, employee relations in non-union organizations, and behavioral theories of labor negotiations.

241 **Strategic Management and Policy Formation** (3)
Processes and theories of strategic management in the profit and not-for-profit sectors. Analysis of behavioral, sociopolitical, and economic forces underlying strategy formulation. Issues of strategic competitive advantage; corporate diversification; multinational corporations; evaluation and choice; and implementation of functional and corporate strategies.

242 **Organizational Communication and Conflict Management** (3)
Theories and models of communications and communication media; barriers to effective communication and techniques for improving interpersonal, group, and organizational communications. Sources of conflict in organizations at the individual, group, and organizational levels; methods of conflict management and resolution.

243 **Seminar: Leadership in Complex Organizations** (3)
The view of leadership taken in this seminar extends theories beyond the interpersonal, near-immediate time frame toward an organizational perspective in which cause-and-effect linkages are traced. The leadership role as an attribute of a system. How effective leaders reduce uncertainty through appropriate adaptive change.

246 **Comparative Management** (3)
International dimensions of management over a broad spectrum of topics, including cross-national transfer and management practices in a global economy; cross-cultural interaction; business–government relations; expatriation and repatriation processes; international strategic management; technology transfer; globalization of human resources management.

248 **Strategic Human Resource Planning** (3)
Overview of the principles of human resource planning. Model for determining human resource requirements, including forecasting, goal setting, human re-

source auditing, and environmental scanning. Analysis of the interfaces between human resource planning and personnel selection, job design, training, compensation, and related functions.

249 **Human Resource Information Systems** (3)
Analysis of information systems designed to support planning, administration, decision making, and control activities of human resource management. Examination of applications such as personnel selection and performance appraisal systems, payroll and benefit management, and career pathing.

250 **Leadership Coaching: Principles and Practices** (3)
An introduction to leadership coaching, including behavioral sciences roots: communication and conflict resolution skills, motivation, personality and performance assessments. Coaching vs. related practice areas; business coaching vs. personal coaching. Professional and ethical standards.

251 **Team Coaching and Facilitation** (3)
Application of the fundamentals and governing values of leadership coaching to the development of productive work groups and communities. The art and practice of facilitation as applied to team learning and the encouragement of breakthrough thinking and team problem solving. Prerequisite: OrSc 242, 250.

252 **Practicum in Leadership Coaching** (3)
Supervised experience as a recipient and practitioner of leadership coaching. Prerequisite: OrSc 242, 250.

295 **Directed Research** (arr.)
Supervised research in selected fields within organizational sciences. Admission by prior permission of faculty advisor and instructor.

297 **Special Topics** (3)
Special topics in human resource strategic planning, computer-based learning, human–computer interaction, management information technology, knowledge management, coaching, and organizational design.

298 **Directed Readings** (arr.)
Supervised readings in selected fields within organizational sciences. Admission by prior permission of faculty advisor and instructor.

PHARMACOLOGY

Professors H.G. Mandel, K.A. Kennedy, V.A. Chiappinelli (*Chair*), S.R. Patierno, D.C. Perry, L.L. Werling, C. Fraser, D. Mendelowitz
Associate Professors P. Lecchi (*Research*), E.M. Sorenson (*Research*), T.G. Hales, E. Kirkness, N. Lee
Assistant Professors M.L. Sutherland, J. Z. Guo (*Research*), C.Y. Ceryak (*Research*), Y. Liu (*Research*), T. O'Brien (*Research*)

Doctor of Philosophy in the field of pharmacology—Required: the general requirements stated under Columbian College of Arts and Sciences. Course requirements include the biomedical sciences core curriculum and Phar 203, 205, 206, 254, 269, and 275.

Research fields: molecular carcinogenesis, genetic toxicology, cancer chemotherapy, neuropharmacology, biochemical and molecular pharmacology and toxicology, drug metabolism, pharmacokinetics, microanalytic pharmacology, mechanisms of drug abuse.

205 **Pharmacology** (7) Perry
Basic principles of pharmacology, including receptor mechanisms, membrane phenomena, drug distribution and metabolism and pharmacokinetics. Lectures, laboratories, and tutorials on the interactions of drugs and biological systems as a basis for rational disease therapy. Prerequisite: BmSc 210, 211, 212; or permission of instructor. (Fall)

206 **Advanced Pharmacology** (3) Perry
Lectures on the interactions of drugs and specific organ systems. Tutorials on current research in pharmacology and toxicology. Prerequisite: Phar 205. (Spring)

230 **Special Topics in Toxicology** (arr.) Staff
Selected aspects of toxicology. Content differs each time the course is offered. May be repeated for credit. (Fall and spring)

240 **Molecular Pharmacology and Toxicology** (2) Patierno
The impact of molecular biology on pharmacology and toxicology. Molecular mechanisms of drug and chemical action. Gene regulation in metabolism, re-

ceptor activity, signal transduction, and cellular stress responses. Gene therapy. Prerequisite: Phar 205, or permission of instructor. (Spring)

242 **Molecular Carcinogenesis** (2) Patierno
Molecular biology of cancer initiation and progression. Molecular mechanisms of DNA sequence alteration and repair. Oncogenes, tumor suppressor genes, and metastasis suppressor genes. Admission by permission of instructor.

254 **Frontiers in Pharmacology** (1) Perry
Recent advances and research in pharmacology. Presentations by laboratory scientists from neighboring institutions. (Fall and spring)

259 **Readings: Cancer and Cancer Chemotherapy** (2) Staff
Selected readings and discussion of recent advances in cancer and cancer chemotherapy research. Prerequisite: Phar 205. (Spring, odd years)

269 **Pharmacology Seminar** (1) Perry
Student research seminar. May be repeated once for credit. Admission by permission of instructor. (Fall and spring)

272 **Physiological Disposition of Drugs** (3) Staff
Mechanisms for the absorption, distribution, metabolism, and excretion of drugs and the physical, chemical, and biological factors affecting these processes are studied through extensive reading of classical and current original literature. Admission by permission of instructor. (Spring)

273 **Pharmacokinetics: Principles and Applications** (2) Staff
A description of compartmental and physiological models of drug disposition. Problem solving to obtain rate constants, organ clearances, etc., from experimental data. Examples of drug disposition exemplifying various pharmacokinetic approaches. (Spring)

275 **Advanced Topics in Pharmacology and Toxicology** (1) Staff
Student presentations on advances in mechanisms of drug action, pharmacology of new drugs, theoretical aspects of pharmacology, laboratory techniques. May be repeated once for credit. Admission by permission of instructor. (Fall and spring)

280 **Neuropharmacology** (3) Perry, Werling
Fundamental principles. Neurotransmitters and their pathways in the central nervous system. Electrophysiological, molecular, and biochemical techniques. Drug effects on neurotransmitter pathways. Biochemical basis of mental disease. Prerequisite: Phar 205 or permission of instructor. (Spring, even years)

295 **Reading and Research** (arr.) Staff
May be repeated for credit.

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

PHILOSOPHY

University Professors P.J. Caws, K.F. Schaffner
Professors W.B. Griffith (*Chair*), R.P. Churchill, D. DeGrazia
Associate Professor G. Weiss
Assistant Professors I. Farber, M. Friend, E.J. Saidel, J.C. Brand-Ballard

Master of Arts in the field of public policy with a concentration in philosophy and social policy—An interdisciplinary program that brings the normative, historical, and analytical-logical skills of philosophical inquiry to bear upon contemporary problems of social policy. The program is affiliated with the School of Public Policy and Public Administration. Prerequisite: a bachelor's degree from an accredited college or university. Students are expected to have completed the prerequisites to graduate courses.

Required: the general requirements stated under Columbian College of Arts and Sciences. Two options are available at the discretion of the faculty: (1) a minimum of 24 credit hours of approved graduate course work plus the successful completion of a thesis (Phil 299–300), or (2) a minimum of 36 credit hours of graduate course work that does not include a thesis. All students are required to take four courses selected from Phil 230, 231, 238, 242, 250, 255, 262, 281, Phil 775; and, for the public policy core, four courses, one

from each of the following groups: (a) PSc 229, 212, 217; (b) Econ 217, 221, 237, 248; (c) PSc 203, WStu 240, E&RP 210, Hist 214; (d) PPol 202, Stat 183 or 111, PAd 296. Electives may focus on a particular policy area (e.g., biomedical/health care, urban/welfare, or environmental policy), or may explore varied approaches and policy issues. Each candidate must pass a Master's Comprehensive Examination based on the particular interdisciplinary composition of the student's program of study. Prospective candidates should consult the program director.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201–2 **Readings and Research** (3–3) Griffith and Staff
Advanced readings and reports. Investigation of special problems. (Academic year)

214 **Structuralism and Hermeneutics** (3) Caws
The notion of structure in the human sciences: its antecedents, linguistic expression, and development in philosophy, anthropology, psychoanalysis, historiography, and criticism. Strategies for the decoding of structure in hermeneutics. The apparent metamorphosis of structuralism in postmodern thinkers.

230 **Ethical Issues in Policy Arguments** (3) Griffith
Critical analysis of ethical foundations of public policy arguments, e.g., about protection of the environment or health and safety, equality of opportunity. Case studies of appeals to "welfare improvements," to norms of duty, to "the social contract," and to rights–claims. Attention to historical contexts and biases. Open to undergraduates only with permission of instructor. (Fall)

231 **Economic Justice** (3) Griffith
Ethical and economic analysis of equity and efficiency of current U.S. income distribution patterns. Theories of justice; economic theories of distribution; assessment of redistribution policies. Open to undergraduates only with permission of instructor. (Spring)

238 **Feminist Ethics and Policy Implications** (3) Weiss
Feminist critiques of traditional ethical reasoning; alternative feminist ethical frameworks examined and applied to contemporary social problems (e.g., reproductive technology, genetic engineering). Prerequisite: Phil 125 or 131 or permission of instructor. Same as WStu 238. (Spring, alternate years)

242 **Philosophy, Law, and Social Policy** (3) Brand-Ballard
Examination of basic questions about the role law can and should play in society. Topics include the nature and basis of rights; theories of constitutional interpretation; proposals for legal and political reform of Western liberal democracy. (Spring)

250 **Topics in Health Policy** (3) DeGrazia
Topics in health policy from the perspective of philosophical ethics, including human and animal research, the enhancement of human traits, justice and health care allocation.

255 **Philosophy of Social Science** (3) Brand-Ballard
An examination of philosophical problems arising from efforts to gain a systematic understanding of society and culture. Topics include the relationship of social science to natural science, feminist social science, rationality, cultural relativism, hermeneutics, and critical theory.

262 **Normative Issues in Foreign Policy** (3) Churchill
Selected issues on foreign policy from a normative perspective, including global poverty and distributive justice, sustainable development, environmental management, the protection of human rights, and the ethics of military intervention.

281 **Environmental Philosophy and Policy** (3) Churchill, Brand-Ballard
Development of philosophical frameworks for analyzing and appraising a wide range of environmental issues and modes of analysis. Attention to both classical problems (pollution, biodiversity) and the new "sustainable economy/ecology" paradigm shift, and to both microeconomic and biocentric modes of analysis and argument.

299–300 **Thesis Research** (3–3) Staff

PHYSICS

Professors D.R. Lehman, B.L. Berman, L.C. Maximon (*Research*), W.C. Parke, R.A. Arndt (*Research*), W.J. Briscoe, C. Bennhold (*Chair*), E.F. Skelton
Associate Professors N.K. Khatcheressian, E.P. Harper, J.R. Peverley, H. Haberzettl, K.S. Dhuga, M.E. Reeves, G. Feldman, I. Strakovsky (*Research*), R.L. Workman (*Research*), A. Eskandarian, F.X. Lee, J. Hanchar
Assistant Professors C. Zeng, S. Strauch (*Research*), J. Balbach, W. Peng
Professorial Lecturer B. Ratnam
Associate Professorial Lecturers J.T. Broach, M.F. Corcoran

Master of Arts in the field of physics—Prerequisite: a bachelor's degree with a major in physics at this University, or an equivalent degree.

Required: the general requirements stated under Columbian College of Arts and Sciences, and 36 credit hours of graduate course work, including Phys 209, 211, 213, 221, 224, 225, 250, 281, and either two courses chosen from Phys 231, 233, 234, 243 or, for the thesis option, Phys 299–300.

Doctor of Philosophy in the field of physics—Required: the general requirements stated under Columbian College of Arts and Sciences, including the following required courses: Phys 209, 211, 213–14, 221–22, 224, 225, 231, 233 or 243.

Research fields: nuclear physics—experimental and theoretical studies on the structure, electromagnetic and strong interactions, and scattering of few-body systems at low and intermediate energies; solid-state physics—experimental and theoretical studies on low-dimensional materials, molecular biophysics, magnetism, and surface physics; interdisciplinary physics, including radiation physics, and applied physics.

Consent of a departmental graduate advisor is required for admission to all 200-level courses in physics.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

209 **Theoretical Methods in Classical and Quantum Physics** (3) Haberzettl
Topics covered include solutions of partial differential equations encountered in physics; techniques of linear algebra; calculus of variations; complex analysis; applications in physics of the theory of analytic functions; integral equations; and group theory in physics.

211 **Advanced Mechanics** (3) Parke, Haberzettl
Analytic methods of mechanics as a basis for modern theory; variational principles, Lagrange's equations, Hamiltonian formulation, canonical transformations, classical perturbation theory. (Fall)

213–14 **Electromagnetic Theory** (3–3) Staff
Principles of electrostatics and magnetostatics with applications to the solution of boundary-value problems in electrically and magnetically active media. Maxwell's equations, time-varying fields, and plane-wave propagation. Radiating systems and scattering of radiation, including multipole fields. Dynamics of relativistic particles and radiation from moving charges. (Academic year)

221–22 **Quantum Mechanics** (3–3) Lee, Haberzettl
General aspects of quantum mechanics with emphasis upon the developmental principles involved. Operators, representations, and transformation theory. Schrödinger and Heisenberg pictures, angular momentum, perturbation theory, scattering theory. (Academic year)

224 **Statistical Mechanics** (3) Zeng, Peng
Classical and quantum statistics. Gibbs paradox, microscopic origins of entropy and other thermodynamic variables, fluctuations, ensemble theory, partition functions, distribution functions, density matrices. Applications include the harmonic oscillator, magnetic systems, ideal Fermi–Dirac and Bose–Einstein systems, blackbody radiation, phonons. (Spring)

225 **Graduate Laboratory** (3) Strauch, Feldman, Reeves
Selected experiments on nuclear and solid-state physics. Laboratory fee, $55. (Academic year)

231 **Quantum Field Theory I** (3) Staff
Local field theory and symmetry principles, field quantization, perturbation calculations, first-order electromagnetic and weak processes, divergence difficulties. (Fall)

232 **Quantum Field Theory II** (3) Staff
Covariant presentation of general theory of quantized fields, path-history quantization, theory of the S-matrix, dispersion relations, and renormalization program. (Spring)

233 **Nuclear Physics** (3) Briscoe, Haberzettl
Nuclear interactions, nuclear models, theory of nuclear reactions, pion physics, weak interactions, and electromagnetic interactions. (Academic year)

243 **Solid-State Physics: Structure and Binding** (3) Reeves, Peverley, Zeng, Balbach
Crystal structure and binding; the reciprocal lattice, X-ray diffraction. Elastic properties, thermal, electric, optical and magnetic properties of solids, dislocations, and other defects. (Fall)

250 **Selected Topics in Physics** (1 to 3) Staff
Student presentations on advanced topics in physics. May be repeated for credit with permission of graduate advisor.

251 **Selected Topics in Theoretical Nuclear Physics** (3) Haberzettl, Bennhold
May be repeated for credit with permission of graduate advisor.

252 **Selected Topics in Experimental Nuclear Physics** (3) Berman, Briscoe, Feldman
May be repeated for credit with permission of graduate advisor.

253 **Selected Topics in Theoretical Condensed-Matter Physics** (3) Zeng
May be repeated for credit with permission of graduate advisor.

254 **Selected Topics in Experimental Condensed-Matter Physics** (3) Reeves, Balbach
May be repeated for credit with permission of graduate advisor.

281 **Computational Physics** (3) Eskandarian
Topics include harmonic motion, celestial mechanics, chaotic systems, fluid dynamics, and other such complex systems that require a computational approach. Prerequisite: three semesters of undergraduate calculus and a complete sequence of calculus-based physics; working knowledge of C or FORTRAN. Laboratory fee, $55. (Fall)

291 **Seminar** (1) Staff
Lectures on current topics in physics. May be repeated twice for credit. (Fall and spring)

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated once for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

POLITICAL MANAGEMENT

Professor F.C. Arterton (*Dean*)
Associate Professors D.W. Johnson (*Associate Dean*), C.B. Cushman, L. Matos (*Research*)
Assistant Professor G. Lebel
Adjunct Professors M. Edwards, B. Rubin
Adjunct Associate Professors J. Hobson, J. Hall, D. Anderson, M. Cornfield
Professorial Lecturer P. Fenn
Associate Professorial Lecturers M. Braden, T. Devine, R. Faucheux, W. Greener, E. Grefe, R. Hoewing, N. Laird, R.K. Roosevelt, R. Thomas, B. Tringali, D. Walter
Assistant Professorial Lecturers K. Schafer, D. McGroarty, J. Slade

Through the Graduate School of Political Management, Columbian College of Arts and Sciences offers the Master of Arts in the field of political management. Students focus their study on one of the following areas within political management: lobbying, corporate public affairs, campaign management, issues management, politics and public policy, fundraising, polling and strategic research, and political leadership. A graduate certificate in PACs and political management is offered as well.

Master of Arts in the field of political management—Prerequisite: a bachelor's degree from an accredited college or university; demonstrable interest or experience in politics; high academic standing.

Required: the general requirements stated under Columbian College of Arts and Sciences. The nonthesis program consists of 36 credit hours of course work; the thesis program

consists of 30 credit hours of course work and 6 hours of thesis (PMgt 299–300). Students are required to complete a 400-hour internship of supervised political management activity. Students are required to take PMgt 201, 202, 207, 260, plus three courses in the chosen area of focus. Those in the nonthesis program must take PMgt 295. Students are expected to take courses in each fall and spring semester and in the summer sessions.

201 **Fundamentals of Political Management** (3) Johnson
An introduction to the field of political management: historical and political analysis of Washington and its centers of power, lobbying and influence, issues and ideology, elections, and ethical considerations. Must be taken in the first semester of studies. (Fall and spring)

202 **Quantitative Methods for Political Managers** (3) Wiley
Techniques of data analysis and the uses and abuses of statistical reasoning, with particular emphasis on applications to electoral campaigns, lobbying, and government relations. Topics include measurement, descriptive statistics, probability, and significance testing. (Fall, spring, and summer)

205 **Research and Data Collection** (3) Walter
Evaluation of research information used by political managers to prepare position papers, analyze candidate records, buy advertising time, analyze constituencies, and target direct mail for canvassing, registration, and get-out-the-vote campaigns. (Spring)

206 **Speech Writing** (3) Staff
Analysis and techniques of effective speech writing and speech presentation for public officials and candidates; emphasis on speech writing for campaigns and public policy forums. (Fall)

207 **Strategy and Message Development** (3) Cornfield, Fenn
The specialized forms of communication that political professionals use to win public support for their candidates and policy positions. Message development: the art and craft of persuasion and the integration of research, strategy, tactics, and public feedback. (Fall, spring, and summer)

211 **Polling** (3) Staff
Survey research uses in campaigns. Major objectives of surveys, designing and drawing samples, constructing and pretesting questionnaires, modes of interviewing, financial implications, practical problems in selecting and monitoring polling organizations, and interpretation of survey data. (Summer)

212 **Political Management and the Media** (3) Greener
Organization, practices, and norms of the major media; media coverage of public officials, political campaigns, legislative battles, interest groups, and issues of public policy. Formulation of strategies for getting favorable news coverage for the issue or candidate and for ending a media crisis. (Spring)

214 **Qualitative Research in Political Management** (3) Tringali
Uses and usefulness of focus groups and small-sample interviews; procedures involved in these techniques; implications of psychological and sociological theory; relationship of qualitative and quantitative research. (Spring)

218 **Politics and the New Media** (3) Cornfield
Use of new media in communications between politicians and citizens, effects on political rhetoric, and quality of communications in contemporary politics. (Summer)

220 **Fundraising** (3) Staff
Raising and spending money in political campaigns, referenda contests, issue politics, and lobbying efforts. Budgeting, control of expenditures, accounting procedures, and general strategies for fundraising. (Summer)

221 **Fundraising for Organizations** (3) Staff
Advanced techniques of fundraising for established political organizations. Long-range financial stability for organizations, including membership strategies, direct mail, telemarketing, and special events. (Spring)

222 **Executive Fundraising** (3) Hall
The business and techniques of fundraising for charitable, trade association, semi-private, and public institutions. (Fall)

230 **Lobbying** (3) Hobson
How lobbying and organized advocacy fit into the American political process and development and implementation of advocacy strategies. Lobbying by business, labor, public interest groups, and other nonprofit organizations; lobbying within and among various branches of government. (Fall and spring)

231 **Lobbying the Budget Process** (3) Edwards
Politics of the budget process, using case studies from recent federal budget cycles. Formal and informal mechanisms of budgeting, the lobbying strategies employed by private and public organizations seeking to influence budgetary decision making, and negotiations within and between executive agencies. Prerequisite: PMgt 230. (Summer)

232 **Managing Government Relations Programs** (3) Staff
Organizational models and techniques used by corporations and business associations to influence the development of public policy at federal, state, and local levels, as well as internationally. (Spring)

233 **Grassroots Politics** (3) Grefe
Lobbying and advocacy strategies and techniques at the local level. Use of grassroots lobbying by corporations, labor unions, civic and nonprofit organizations, and special interest groups. (Spring)

234 **International Lobbying** (3) Laird, Roosevelt
Examination of the current state of international lobbying and analysis of strategic models. (Spring)

236 **Corporate Public Affairs** (3) Hoewing
Exploration of major functional areas in public affairs, with focus on political and policy dynamics. (Fall)

237 **Advanced Lobbying Strategy** (3) Slade
Current case studies of major policy initiatives; simulation of roles of participants in lobbying campaigns, strategies integrating issue research, qualitative and quantitative analysis. Prerequisite: PMgt 230 or 231. (Fall and summer)

240 **Campaign Management** (3) Devine, Faucheux
Orientation to the basic systems that must be managed to produce electoral victory. Importance of the campaign plan and campaign budget as techniques of management. (Fall and spring)

241 **Campaign Advertising and Promotion** (3) Fenn
Strategies for the use of the various media in political campaigns, with an emphasis on television and the development of campaign messages; production, timing, and placement of television advertising. Students design print ads and brochures and produce a 30-second television spot. Laboratory fee, $200. Prerequisite: PMgt 240. (Spring)

242 **Campaign Organization** (3) Lebel
Choices facing the campaign manager: assessment of the candidates, making the decision to run, fundraising, geographic and demographic targeting, field organization, canvassing, phonebanks and get-out-the-vote, press operations, financial control, and relations with the party and interest groups. Prerequisite: PMgt 240. (Spring)

243 **Strategic Factors in Presidential Campaigns** (3) Staff
Presidential campaign strategy: campaign organization, fundraising, primaries and caucuses, delegation selection rules, party conventions, national and state party organizations, and the general election.

244 **International Political Consulting** (3) Johnson
Advanced seminar focusing on professionalization of elections and modern campaign techniques. (Spring)

246 **Political Communications Strategy** (3) Walter
The role of the communications director. Message development and implementation of a coordinated communications strategy. Integration of paid and free media coverage. (Summer)

247 **Advanced Campaign Strategy and Management** (3) Staff
Strategy, tactics, and management of campaign research, polling, message formulation, and media. Prerequisite: PMgt 240. (Fall and summer)

250 **Issues Management** (3) Rubin
Management of public policy issues, rise of referenda and citizen initiatives, proliferation of issue-oriented campaigns directed at the grassroots. How individuals and interest groups participate in the issue advocacy process and the evolving role of political and campaign managers in issue campaigns. (Fall and spring)

251 **Public Opinion Dynamics** (3) Wiley
Processes by which citizens make decisions about political issues and consider the range of methods for influencing those decisions. Public opinion polling,

voter behavior studies, communications, media studies, and attitudinal change. (Summer)

252 **Crisis Management** (3) Edwards
Management of crisis situations and "defining moments" in electoral, legislative, and public policy campaigns. Through the use of simulation exercises and recent case studies, the course explores both the theoretical and practical aspects of crisis management. (Fall)

254 **Referendum Politics** (3) Staff
Managing the politics of initiative petitions and referendum elections to establish public policy. (Spring, odd years)

257 **Strategic Management of Political Issues** (3) Grefe
Case studies of major current policy questions. Development of strategy and message development integrating research, polling, and focus group analysis. (Fall and summer)

260 **Ethics and Political Management** (3) Anderson
Application of ethics to political campaigning, lobbying, and representation generally; norms of conduct that should guide activities and working relations of candidates, campaign consultants, polling organizations, political reporters, lobbyists, legislators, and officials. (Fall, spring, and summer)

262 **Law of the Political Process** (3) Braden
Legal and constitutional framework for political process, including ballot access, voter registration, and laws governing political parties and political organizations, campaign finance, political broadcasting, lobbying registration, and ethics in public service. (Summer)

265 **Special Topics** (3) Staff
Topic to be announced in the *Schedule of Classes*.

266 **Budgetary Policy** (3) Staff
Analysis of U.S. monetary and fiscal policy. Off-campus only. (Spring)

267 **Budgetary Politics** (3) Staff
Examination of federal budget policymaking and politics. Off-campus only. (Fall)

268 **PACs and Congress** (3) Staff
Political action committees in the United States in the context of wider arenas of campaign finance, elections, and issue management.

269 **Specialized Skills in Political Management** (1) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated, provided the topic differs, to a maximum of 6 credits.

280 **Leadership and Politics** (3) Staff
Leadership in the political realm in comparison to the corporate and nonprofit sectors. (Spring)

281 **Running for Office** (3) Faucheux
Electoral politics from the perspective of the candidate, strategic and personal factors involved in the decision to run, consequences of victory or defeat. (Summer)

282 **Leadership in Public Office** (3) Staff
How elected officials must govern while balancing electoral support and policy perspectives. (Spring)

299 **Independent Study** (3 to 6) Staff

295 **Advanced Problems and Strategy** (3) Arterton
Capstone seminar that integrates research skills and political techniques required to define political objectives and develop the appropriate strategies to accomplish such objectives. Students must have completed 24 credit hours to enroll in this course. (Fall, spring, and summer)

299–300 **Thesis Research** (3–3) Staff
Master's degree candidates must apply to the program committee for thesis approval and have completed 24 credit hours with a 3.3 GPA.

POLITICAL PSYCHOLOGY

Professor J.M. Post

The Elliott School of International Affairs offers a course sequence (which may lead to a graduate certificate) in political psychology.

201 **Fundamentals of Political Psychology** (3) Post
A review of the interdisciplinary field of political psychology; examination of psychological influences on political behavior at the level of the individual and small group; the psychology of leader–follower relationships; crisis decision making. (Fall)

202 **Political Psychology Research Methods** (3) Staff
Major research methods of political psychology, using classic articles in the field. Both quantitative methods, such as survey research and content analysis, and qualitative methods, such as personality profiling and comparative case studies, are considered. Prerequisite: PPsy 201. (Fall)

203 **Public Opinion and Political Socialization** (3) Staff
Same as PSc 220.

204 **Theory and Practice of International Negotiations** (3) Staff
Same as IAff 204.

205 **Political Violence and Terrorism** (3) Post
The origins and the sociopolitical and behavioral dynamics of political violence and terrorism. Major types of terrorism are differentiated. Implications for anti-terrorist policy. The psychology of hostages. (Spring)

291 **Applied Political Psychology** (3) Post
Seminar and practicum in applications of political psychology. Prerequisite: PPsy 201. (As arranged)

295 **Independent Study and Research** (1 to 3) Post
Supervised research in a special topic in political psychology. Preparation of major research paper. Prerequisite: PPsy 201, 202. (As arranged)

POLITICAL SCIENCE

University Professor J.N. Rosenau
Professors B. Reich, J.M. Logsdon, H.R. Nau, M.A. East, J.B. Manheim, C. McClintock, L. Sigelman, M.J. Sodaro, S.L. Wolchik, H. Harding, D. Shambaugh, C.J. Deering (*Chair*), H.B. Feigenbaum, N.J. Brown, H.L. Wolman, F. Maltzman, M. Finnemore, J. Goldgeier
Associate Professors J.H. Lebovic, R.P. Stoker, A. Bowie, S.K. Sell, D.D. Avant, B. Dickson, P. Wahlbeck, L. Zeng, M.M. Mochizuki, S.J. Balla, S. Binder, S. Wiley, I. Creppell
Assistant Professors J.M. Smith, E.Z. Csergo, W.J. Winstead, E. Voeten, E.A. Posner, M.A. Schwartzberg, K.J. Morgan, A.E. Searight, C. Rector, S. Kelts, E.D. Lawrence, G.S. Lambright, H. Farrell

Master of Arts in the field of political science—Prerequisite: a bachelor's degree from an accredited college or university, or an equivalent degree, and high undergraduate scholastic standing.

Required: The general requirements stated under Columbian College of Arts and Sciences, a research tool, and a general examination in a primary field. The research tool may be reading knowledge of a modern foreign language, a specified level of knowledge in statistics, or two graduate-level courses in a cognate discipline. Students prepare for general examinations by taking at least six courses selected according to departmental guidelines in their chosen field. Four primary fields are available: American politics and government; international relations; comparative and foreign politics; and public policy. Political theory and research methodology are available as supporting fields. Students are required to take at least two courses outside of their primary field. Students may elect one of the following programs: (1) 30 credit hours of graduate course work, including PSc 299–300, and the satisfactory completion of a master's thesis; or (2) 33 credit hours of graduate course work without a thesis.

Doctor of Philosophy in the field of political science—Students of outstanding ability are admitted to the doctoral program upon recommendation of a departmental graduate committee and the concurrence of Columbian College.

Required: The general requirements stated under Columbian College of Arts and Sciences, two research tools, a General Examination covering both a primary and supporting field, and a dissertation demonstrating the capacity to undertake original and significant research. The research tools may be selected from reading knowledge of a modern foreign language, a specified level of knowledge in statistics, or two graduate-level courses in a cognate discipline. Students prepare for the General Examination by taking at least six courses in their primary field and at least four courses in their supporting field, selected according to departmental guidelines. Four primary fields are available: American politics

and government; international relations; comparative and foreign politics; and public policy. In addition, political theory and research methodology are available as supporting fields.

All students must complete a sequence of courses in research methodology comprising PSc 201 and either PSc 202 or 209. Students may opt to take all three. Completion of PSc 202 with a grade of *B* or higher will be taken as evidence that a student has achieved the level of knowledge in statistics necessary to satisfy one of the research tool requirements as outlined above.

General examinations are given three times per year. Students may take both their primary and secondary field examinations during the same testing period, or they may take them in successive semesters. The examination in the primary field entails both a written and oral component.

A recommendation to the dean for admission to candidacy, or the dissertation research stage, will be considered upon satisfactory completion of all course work, tool requirements, and field examinations. Students must pass their primary field examination with a satisfactory pass or higher and must pass their supporting field examination with a bare pass or higher in order to be considered eligible for promotion to candidacy. Admission to candidacy is permitted only if the student's performance on the examinations and in the course work gives a good indication of success in the second unit. Passing the field examinations does not in itself ensure admission to candidacy.

The dissertation prospectus must outline the central research question(s), relate the proposed research to the existing literature, detail a research methodology, and explain the nature of the original contribution that the completed project will provide. The prospectus must be presented and defended in an open forum, which all faculty and doctoral students are invited to attend.

A newly developed dual degree program enables students to earn the Master of Public Policy along with the Ph.D. in the field of political science.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Introduction to Empirical Political Analysis** (3) Wahlbeck, Zeng, Lawrence
Statistical foundations of empirical political analysis and computer applications. Basic probability theory, exploratory and descriptive data analysis, statistical inference, and introduction to linear regression. Laboratory fee, $20.

202 **Empirical Political Analysis** (3) Wahlbeck, Zeng
Techniques of social science data analysis. Model building, estimation, and interpretation. Linear models and extensions. Introduction to discrete choice models. Prerequisite: PSc 201 or permission of instructor. Laboratory fee, $20.

203 **Approaches to Public Policy Analysis** (3) Stoker, Balla
Empirical and normative foundations of systematic policy analysis: concepts, theories, models, issues, strengths, limitations, and uses and misuses in the policy process.

205 **Readings in Political Theory** (3) Creppell, Schwartzberg, Kelts
Selected major works, both ancient and modern, that illuminate basic problems and questions of political theory.

206 **Topics in Political Theory** (3) Creppell, Schwartzberg, Kelts
Advanced readings and group discussions. Analysis and interpretation of selected concepts and schools of thought.

207 **Modern Political Thought and Ideologies** (3) Staff
Analysis of some main currents in modern political thought and ideologies.

208 **Russian Political Thought** (3) Staff
Analysis of contemporary Russian political thought and its antecedents.

209 **Systematic Inquiry and Research Design** (3) Avant, Deering
Study design, data collection, and models of analysis in political science.

210 **American Political Process** (3) Deering, Maltzman
A survey of American political institutions, processes, and behavior.

211 **Urban Politics** (3) Wolman
Comparative analysis of the context, institutions, processes, and policies of urban political systems.

212 **Urban Policy Problems** (3) Wolman
Analysis of public policy issues confronting urban governments; emphasis on the theoretical roots and empirical impact of past and present programs in such areas as housing, education, poverty, and crime.

213 **Judicial Politics** (3) Wahlbeck
Introduction to the literature of judicial process and behavior studies; specific focus on selected topics. Emphasis on the major subfields of law, courts, and judicial process.

215 **Judicial Policymaking** (3) Wahlbeck
Role of the judiciary in policy formulation; emphasis on the U.S. Supreme Court and civil liberties issues.

216 **American Presidency** (3) Maltzman
Personalized and institutionalized aspects of the presidency, with particular emphasis on the politics of contemporary policymaking.

217 **Executive Branch Politics** (3) Balla
Structure and operation of governmental bureaucracy with particular emphasis on the politics of formulating and implementing public policy.

218 **Legislative Politics** (3) Deering, Maltzman, Binder
Theory, structure, and process of the U.S. Congress, with emphasis on member–constituency relations, individual and collective decision making, party and committee activities, executive–legislative relations, and interest-group activities.

219 **American Political Parties and Elections** (3) Binder
Nature and functions of American political parties: organizational status, nominating and electoral politics, and role in governing.

220 **Public Opinion and Political Socialization** (3) Staff
Sources and dynamics of public opinion and political socialization. Same as PPsy 203.

221 **Interest-Group Politics** (3) Deering
Theory, structure, and activities of interest groups in American politics.

222 **Executive–Legislative Relations** (3) Staff
Political and institutional relationships between the executive and legislative branches of the federal government. Offered off campus only.

224 **Domestic Policy Analysis—Selected Topics** (3) Balla
Analysis of U.S. policy toward selected domestic problems.

226 **Politics and Organizations** (3) Finnemore
Theoretical approaches to understanding organizational behavior and change; applications to specific political problems in U.S., international, and comparative politics.

228 **Media and Politics** (3) Staff
Role of the media in American politics, with emphasis on television news coverage, political debates, political advertising, and their impact on the electorate.

229 **Politics and Public Policy** (3) Stoker, Balla, Wolman, Lawrence
Examination of political processes that influence policy formulation, policy implementation, and the uses of policy analysis. Same as PPol 201.

230 **Comparative Government and Politics** (3) McClintock, Dickson
Open to Elliott School students only. Examination of basic approaches to comparative politics.

232 **Communism and Democratization** (3) Sodaro
Comparative analysis of transitions to democracy in communist and postcommunist systems, with applications of democratic theory.

233 **Comparative Post-Communist Systems** (3) Reddaway
How the government and politics of the 15 successor states of the Soviet Union have evolved since they became independent in 1991. An attempt to understand how and why their governmental systems have come to vary from partially consolidated democracies to one-man dictatorships.

234 **Democracy and Democratization in Comparative Perspective** (3) Brown, Dickson, McClintock
Theoretical approaches to processes of democratization. Evaluation of cultural, economic, institutional, and international-actor approaches. Case analysis of recently transitioned or transitioning nations. Primarily for Ph.D. students in political science.

235 **The Politics of Industrialization** (3) Bowie, Lambright
Comparative analysis of politics as it has affected and been affected by the process of industrialization, with special attention to the economies of Latin America and East and Southeast Asia. Cross-regional comparison of processes of industrialization and development.

236 **The Political Economy of Developing Areas** (3) Bowie
Comparative analysis of how development problems have been defined from both political and economic perspectives and the solutions proposed by outsiders and insiders. Emphasis on the rise and fall of development orthodoxies.

237 **Theories of Political Development** (3) Feigenbaum
Examination of how and why political systems develop the way they do. Why do some countries develop into democracies, while others become authoritarian? How do class conflict, the nature of the elite, and the political culture affect the development of political institutions?

238 **U.S. Foreign Economic Policy** (3) Nau
Exploration of ideas and issues involved in U.S. foreign economic policy, including relationship of economic and security issues, interdependence, protectionism, role of the dollar, industrial policy, and the debt crisis.

239 **International Political Economy** (3) Sell, Nau, Posner
Research seminar exploring alternative theoretical approaches to the study of international political economy and their application to the explanation and interpretation of historical and contemporary events in world political and economic affairs. Primarily for Elliott School degree candidates.

240 **International Politics** (3) Lebovic, East, Nau, Posner
Open to Elliott School students only. Theories of international relations.

242 **Politics and Practice of International Institutions** (3) Finnemore, Voeten
The politics of international institutions in the areas of collective security, peace keeping, trade, money, development, environment, human rights.

244 **Politics of International Law** (3) Smith
The political sources and consequences of international law and norms.

245 **Comparative Foreign Policy** (3) East
The relationship of international actors with one another and with their external environment analyzed in a comparative framework. Focus on nation-states as well as non-state actors, such as international organizations. Differences and similarities in policies on economics, diplomacy, security, and global issues.

246 **U.S. Foreign Policy** (3) Goldgeier
Patterns and problems in contemporary U.S. foreign policy. Special attention given to the domestic political factors shaping foreign policy.

247 **U.S. Foreign Policy After the Cold War** (3) Nau
Contemporary debate about the substance of American foreign policy in the post-Cold War world through the lens of alternative theoretical approaches to the study of international relations. Classical realist (national interest), neorealist (balance of power), neoliberal (international interdependence and institutions), and constructivist (national identity) interpretations are compared.

248 **Politics of U.S. National Security Policy** (3) Avant
Examines competing theoretical approaches to the study of national security policy and tests these on a variety of substantive issue areas in the United States. (May include such topics as nuclear non-proliferation, responses to regional conflicts, definition of new security goals, etc.)

249 **International Security Politics** (3) Avant, Goldgeier, Dassa Kaye
The major theoretical debates in the field of international security. Topics include the causes of war, civil–military relations, deterrence, arms control, alliance formation, crisis management, technological dependence, ethnicity, migration, and environmental degradation. Primarily for Elliott School degree candidates.

250 **Foreign Policy Analysis—Selected Topics** (3) Staff
Analysis of U.S. foreign policy toward selected world regions.

251 **Civil–Military Relations** (3) Avant
Substantive and theoretical issues and debates in the study of civil–military relations.

257 **Arms Control and Disarmament** (3) Staff
Major issues and trends in the postwar development of U.S. arms control and disarmament policy.

260 **Western European Politics** (3) Feigenbaum
Examination of the principal characteristics of the British, French, German, and Italian political systems, comparing their institutional and behavioral adaptations to the problems of advanced industrial democracies.

261 **Politics of European Integration** (3) Sodaro
The origins, institutions, and politics of West European integration, with emphasis on theories of regional integration and the development of the European Union.

262 **The Political Economy of Advanced Industrial States** (3) Feigenbaum
An examination of the relationship between economics and politics in areas such as political development, trade, and monetary policy.

264 **Comparative Governments and Politics of Eastern Europe** (3) Wolchik
Comparative analysis of domestic political processes and policies in Eastern Europe.

265 **The International Politics of Eastern Europe** (3) Wolchik
Major historical, political, social, and regional factors that have shaped the interwar, World War II, and postwar evolution of Eastern Europe; emphasis on foreign relations with outside powers and on regional East–West contacts.

266 **Government and Politics of the USSR** (3) Staff
Seminar on Soviet domestic government and politics, treated historically (1917–1991).

268 **Post-Soviet Foreign Policies** (3) Staff
External problems and policies of Russia and the other successor states of the former USSR (especially the Baltics, Ukraine, and southern rim of the former Soviet Union).

270–71 **Politics of China** (3–3) Dickson, Harding, Shambaugh
PSc 270: Readings and discussion of the political dynamics and policy process in contemporary China. PSc 271: Research seminar on selected topics in Chinese politics, using official and other primary sources. Prerequisite to PSc 271: PSc 270 or permission of instructor.

272 **Foreign Policy of China** (3) Shambaugh, Harding
Readings and research on the main approaches to analyzing China's foreign policy and foreign relations.

273 **The Political Economy of Asia** (3) Bowie
Comparative analysis of the relationship between economic interests and politics in East and Southeast Asia. Emphasis on capitalist economies and their integration into global trade and investment networks.

274 **Governments and Politics of Japan and Korea** (3) Staff
Readings and research on the domestic and foreign policies of Japan and North and South Korea.

275 **International Politics of East Asia** (3) Harding, Mochizuki, Shambaugh
Foreign policies and international behavior of the regional states (especially China, Japan, and Vietnam) and the extraregional powers (especially the U.S. and Russia).

276 **The Arab–Israeli Conflict** (3) Reich
Readings and research on the origins, evolution, and issues of the Arab–Israeli conflict.

277 **Comparative Politics of the Middle East** (3) Reich, Brown
Readings and research on selected problems of the governments and politics of the Middle East.

278 **International Relations of the Middle East** (3) Reich, Brown, Dassa Kaye
Readings and research on the regional and international relations of the Middle East.

279 **The Powers in the Middle East** (3) Reich
The role of the powers in the Middle East, with emphasis on the policies of the United States and the Soviet Union. Consideration is given to other major European and Asian powers.

283 **Comparative Politics of Latin America** (3) McClintock
Readings and discussion on the politics of selected countries in South America, Central America, and the Caribbean. Emphasis on the possibilities for democracy and revolution.

284 **International Relations of Latin America** (3) McClintock
Readings and discussion on U.S.–Latin American relations and the foreign policies of selected states.

285 **Topics in Empirical and Formal Political Analysis** (3) Zeng, Lebovic, Wahlbeck
Selected topics in quantitative political methodology and formal political theory with varying emphasis on maximum likelihood estimation, nonlinear models,

causal inference, formal theories, and mathematical/computational tools for the social sciences. May be repeated for credit. Prerequisite: PSc 202 or equivalent. (Offered as the demand warrants)

286 **Selected Topics in American Politics** (3) Staff
In-depth coverage of significant theoretical and empirical issues in American politics, including such topics as political behavior, electoral politics, and race and politics. For advanced students. (Offered as the demand warrants)

287 **Selected Topics in Political Theory** (3) Staff
In-depth coverage of significant issues in political theory, including such topics as justice, toleration, and political community. For advanced students. (Offered as the demand warrants)

288 **Selected Topics in Comparative Politics** (3) Staff
In-depth coverage of significant theoretical and empirical issues in comparative politics, including such topics as democratization, the politics of development, the role of the state in advanced industrial societies, gender and ethnicity, and the politics of nationalism. (Offered as the demand warrants)

289 **Selected Topics in International Politics** (3) Staff
In-depth coverage of significant theoretical and empirical issues in international politics, including such topics as comparative foreign policy, ethics and norms in international politics, the politics of military intervention, and theories of security in a post-Cold War environment. For advanced students. (Offered as the demand warrants)

297 **Reading** (3) Staff
Limited to graduate degree candidates. Written permission of instructor required.

298 **Research** (3) Staff
Limited to graduate degree candidates. Written permission of instructor required.

299–300 **Thesis Research** (3–3) Staff

331 **Advanced Theories of Comparative Politics** (3) Feigenbaum
Topics may include political culture, rational choice, economic development, state–society relations, democratization, and regime change.

341 **Advanced Theories of International Politics** (3) Sell
Perspectives examined range from realism to critical theory and focus upon a variety of explanatory variables.

352 **Theories of International Security** (3) Avant
Focus on conflict in different systems and scenarios and on causes and consequences of different strategies. The role of ethics in international security.

353 **Advanced Theories of International Political Economy** (3) Smith
Major theories of political economy, from classical perspectives on problems of international cooperation to modern treatments of trade, finance, investment, and regulation.

354 **Advanced Theories of Foreign Policy Decision Making** (3) Goldgeier

397 **Advanced Reading** (3) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

398 **Advanced Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

PROFESSIONAL PSYCHOLOGY

Professors J.C. Miller, D.E. Holmes (*Acting Director*), L.J. Ingraham
Associate Professors P.A. Jennings, R.C. Fritsch, C.E. Parks
Assistant Professors M.D. Jasnow, Y.E. Alechina, J.A. Kassett, E.C. Klosson
Assistant Professorial Lecturers E.B. Fritsch, K.R. Miller, M.L. Wylie, D.E. Cooper, E.W. Baughman, B.P. Jones, A. Nover, J. Hanback

Clinical Training Staff

Clinical Professor J. Borriello
Assistant Clinical Professors M. Harris, P.L. Ellman, Q. Graham, C. Verghese

Through the Center for Professional Psychology, Columbian College of Arts and Sciences offers the degree of Doctor of Psychology.

Doctor of Psychology in the field of clinical psychology—Prerequisite: the degree of Bachelor of Arts with relevant background and experience in psychology or its equivalent. Students who lack adequate preparation will be expected to complete prerequisite undergraduate courses during the first year of the program; credit for such courses does not apply to the degree.

Required: the general requirements stated under Columbian College of Arts and Sciences. The three-year program includes the core curriculum (PsyD 201–2, 204, 205, 206, 207, 209, 220–21, 225–26, 227, 244); seven courses chosen from two tracks—four from a designated major and three from a designated minor—as indicated in the listing of tracks below; satisfactory completion of the General Examination in the core and major areas of study; and the completion of the practicum seminar (PsyD 203) for each of the nine semesters of the program.

In addition, successful completion of an externship—a year-long, part-time supervised clinical assignment—is required in each year of the program. A failed externship may, in exceptional circumstances and with the approval of the program director, be repeated. If the student fails a second time, no further opportunity will be provided, and the student's degree candidacy is terminated.

A one-year, full-time internship at an institution approved by the program faculty is required for completion of the degree program. If the student fails the internship, no further opportunity will be provided, and the student's degree candidacy is terminated.

Tracks: Psychodynamic psychotherapy (the PsyD 230s), community psychology (240s), diagnostic assessment (250s), child therapy (260s).

Note: PsyD courses are limited to students enrolled in the Center for Professional Psychology except by permission of the director. See the Department of Psychology for the degree program leading to the Doctor of Philosophy in the field of clinical psychology.

201–2 **Psychological Assessment** (3–3)
Cognitive and projective testing, focusing on core batteries used in intellectual and personality assessment. Laboratory fee, $30 per semester.

203 **Practicum in Clinical Psychology** (1 to 3)
A continuing practicum, repeated in each semester and summer of the program's three years. One credit each in the fall and spring, three credits in a summer session. In year one, focused on psychological assessment; in upper years, on psychological intervention related to the student's choice of tracks.

204 **Biological Basis of Clinical Psychology** (3)
The structure and function of the nervous system and its application to understanding psychopathology. Development of the nervous system in interaction with learning and experience as a central basis of human growth and disability.

205 **Psychodynamic Psychopathology** (3)
The developmental psychodynamic basis for understanding psychopathology, with comparisons to relevant biological and social explanatory factors.

206 **Cognitive Basis of Clinical Psychology** (3)
The theoretical and experimental basis of learning, memory, and cognition. Cognitive growth, maturation, and learning. Cognitive development in relation to adaptive and maladaptive resolution of conflict.

207 **Group and Organizational Dynamics** (3)
Social aspects of adaptive and maladaptive dynamic patterns; group structure and the individual; shared unconscious ideas in wish and defense; small, large, and intergroup (community) dynamics and intervention.

209 **Statistics and Research Design** (3)
The role of measurement, design, and statistics in clinical psychological research; basic descriptive and inferential statistics; analysis of variance and multivariate designs; case study designs; clinical field research; process analysis.

210 **Professional Issues** (3)
The legal and ethical issues in the conduct of professional psychology, including confidentiality, ethical competence, privilege, expert testimony, malpractice, and the insanity defense. Business and ethical issues concerning private practice, licensing, certification, forensics, and insurance reimbursement.

215 **Adolescence** (3)
The unique characteristics of the adolescence phase—normal development, psychopathology, and treatment approaches. Treatment of the severely disturbed adolescent.

220–21 **Psychodynamic Psychotherapy** (3–3)
A one-year course on psychodynamic theory, technique, and research relating to individual psychotherapy. Readings in Fenichel, Brenner, Kohut, Klein, Perls, Rogers. Recent developments in theory and technique. Professional ethics.

222 **Behavioral–Cognitive Therapies** (3)
Theoretical and clinical approaches to understanding and modifying behavior, affect, and thought from behavioral and cognitive perspectives. History and development of these perspectives; current work on psychotherapy integration across varying therapeutic approaches.

225 **Ego Psychology** (3)
An introduction to modern ego psychology: from Freud and Hartmann to Anna Freud, Brenner, Sandler, Abend, Arlow.

226 **Object Relations Theory** (3)
A historical survey of object relations theory, from Klein, Fairbairn, Winnicott to Bion, Kernberg, Mahler, Jacobsen, Kohut.

227 **History and Systems of Clinical Psychology** (3)
A review of the historical development of clinical psychology; its roots in mainstream psychology and psychiatry; its modern technical and theoretical systems.

230 **Recent Developments in Technique** (3)
Current topics and controversies in psychotherapy technique. Readings in Gill, Ross, Brenner, Arlow, Gray, Schwaber, Stone, Etchegoyen.

231 **Short-Term Psychotherapy** (3)
A study of brief psychodynamically oriented psychotherapy interventions. Focus on clinical vignettes; readings in Werman, Davanloo, Sifneos, and others.

232 **Character Pathology: Theory and Technique** (3)
Recent contributions to the understanding of character pathology and its implications for treatment. Readings in Kernberg, Kohut, Abend, Porder and Willick, Klein, Bion, Winnicott.

233 **Issues in Gender Development** (3)
Studies of similarities and differences in male and female gender development. Recent theoretical and clinical contributions. Writings of Stoller, Blum, Tyson and Tyson, Galenson and Roiphe, Kleeman, Chassaguet-Smirgel.

234 **The Nature of Therapeutic Action** (3)
How therapy works to bring about change. The function of affect. The role of fantasy and the process of working through. Conflict and compromise in adaptive and maladaptive functioning.

240 **Group Psychotherapy** (3)
Theory and technique in group psychotherapy; history of group therapy and group analysis; current controversies in the field. Readings in Bion, Ezriel, Scheidlinger, Whitaker, Foulkes, Pines, Anzieu, Ganzarain.

242–43 **Psychology and Law** (3–3)
The psychological study of the legal process and the application of psychodynamic principles and findings in the legal process. Studies and intervention in the judicial and correctional systems; judge and jury studies; psychological testimony, corrections research and reform; working with special forensic systems and populations.

244 **Cultural Factors in Psychopathology and Psychotherapy** (3)
The study of cultural forces as both cause and effect variables in psychopathology and psychotherapy. Cultural factors in resistance and transference. Readings in Kardiner, Srole, Dollard, Lerner, Holmes, Fischer.

245 **Advanced Group and Organizational Dynamics** (3)
For students interested in learning to conduct research or engage in consultation in groups and organizations. Advanced techniques of diagnosis, clarification, and interpretation.

246 **Community Intervention** (3)
Theory and research in community mental health intervention. Work with community organizations on focal projects. Readings in Sarason, Goldenberg, Miller et al., Levinson, Kaplan.

250 **Neuropsychological Assessment** (3)
Theory and practice of neuropsychological assessment. History and development of the field. Major batteries, individualized approaches, and specialized tests.

251 **Advanced Psychodynamic Assessment** (3)
Recent trends in projective testing; Lerner and Lerner, Schafer, Allison and Blatt, Kwawer, Sugarman, Exner.

252 **Child and Adolescent Assessment** (3)
Case seminar with clinical presentations, focused on the core clinical battery. Problems of differential diagnosis between neuropsychological hypotheses and conflict-based hypotheses. Readings in Siegal, Ames, Rothstein, Rabin and Rabin, Hayworth, Sattler.

255 **Forensic Assessment** (3)
Overview of the professional standards and ethics guidelines for forensic evaluations. The psychological assessment of criminal cases, the role of the psychologist in expert testimony, and concepts and principles of law encountered in the forensic evaluation process. The role of theory and research in the criminal evaluation process.

260 **Child Development** (3)
Cognitive and emotional factors in the development of normal and abnormal personality dynamics in children and adolescents: experiential and maturational aspects, learning disabilities, the development of conflict and compromise formations; the relevance of child development to adult psychodynamics and psychotherapy.

262 **Child and Adolescent Psychopathology** (3)
Theory and research on child and adolescent psychopathology. The development of diagnostic categories and their relevance to psychodynamic viewpoints. Readings in Klein, A. Freud, Yorke, Sandler and Sandler, Greenspan, Stern, Mahler, Blos, Tyson and Tyson, Neubauer, Nagera.

264 **Child and Adolescent Psychotherapy** (3)
Case seminar on child and adolescent treatment. Biological and psychological treatments; intensive vs. short term; conceptualizations of play therapy; differences from adult techniques. Readings in Sandler, Tyson and Kennedy, A. Freud, Glenn.

265 **Family Therapy** (3)
Survey of classical and modern theories of family structure and therapy. History and development of the field. Major schools and current controversies. Readings in Whitaker, Ackerman, Palazzoli, Bowen, Framo, Haley, Hoffman, Satir, Slipp.

266 **Clinical Intervention in Schools** (3)
Theory and practice of clinical psychological interventions in schools. Testing, observation, consultation. Readings in Newman, Sarason, Goldenberg, Kaplan.

267 **Advanced Child Psychotherapy** (3)
Technical approaches to selected clinical problems and populations. Topics include trauma, physical and sexual abuse, problems in learning and attention, gender identity disorder, behavior problems, adoption, divorce, and working with borderline children. Understanding and interpreting the child's play, coordination of developmental and therapeutic processes, and collateral work with parents.

270 **Current Topics in Clinical Psychology** (arr.)
May be repeated for credit provided the topic differs.

271 **Independent Study (arr.)**

PSYCHOLOGY

Professors E. Abravanel, J. Miller, L.A. Rothblat, R.A. Peterson, P. Wirtz, D. Reiss, C.K. Sigelman, G. Howe (*Research*), L.R. Offermann, P.J. Poppen, E. Hirshman (*Chair*), W.J. Frawley, M.C. Zea
Associate Professors L. Brandt, C.A. Rohrbeck, S. Dopkins, S.D. Molock, J.M. Ganiban, D.P. Costanza, E. Davis, P.J. Moore
Assistant Professors C. Beil (*Research*), N. Vasilopoulos, J.W. Philbeck, D.E. Schell, C. Gee, N. Le, A.N. Zucker, T.L. Dodge, S. Lambert, M.H. Sohn
Adjunct Assistant Professor K. Ross-Kidder

Clinical Training Staff

Associate Clinical Professors D.M. DePalma, R.L. Jenkins, L.E. Moldauer
Assistant Clinical Professors H.S. Lovett, A.L. Auerbach, E.A. Wiggs, S. Martin

Doctor of Philosophy in the field of psychology—Prerequisite: the degree of Bachelor of Arts with a major in psychology. Students whose academic preparation is in other disciplines will be expected to complete prerequisite undergraduate courses to prepare for graduate study in psychology before admission to the field.

Required: the general requirements stated under Columbian College of Arts and Sciences, including (1) Psyc 202, two graduate psychology courses outside the chosen field and approved by the advisor, and appropriate statistics courses; and (2) the satisfactory completion of a first-year examination and the General Examination in the major area of study. The Department of Psychology offers concentrations in clinical psychology, cognitive neuropsychology, and applied social psychology. The concentration in industrial/organizational psychology is offered by the Department of Organizational Sciences and Communication. For specific requirements, consult the director of the concentration concerned.

Courses at the 200 level are limited to graduate students in psychology, except by permission of instructor. With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

202 **Psychological Research Methods and Procedures** (3) Staff
Required in all graduate psychology programs. Includes philosophy of science, types of research design, and methods of data collection. Prerequisite: graduate standing, a laboratory course in psychology, and a course in statistics.

203 **Experimental Foundations of Psychology: Learning, Memory, and Cognition** (3) Dopkins
Current conceptions of learning, memory, and cognition; the research upon which these conceptions are based; applications to practical contexts.

204 **Experimental Foundations of Psychology: Biological Basis of Behavior** (3) Rothblat
Introduction to the structure and function of the nervous system. Topics include neural communication, sensory processes, memory, neuroendocrinology of sex differences and stress, psychiatric and neurodegenerative disorders.

207–8 **Psychological Assessment** (3–3) Staff
Open only to clinical graduate students in the Department of Psychology. Theoretical and clinical aspects of assessment; includes interviewing, psychometric tests, and projective techniques. Two-hour laboratory—diagnostic work at clinical facilities. Material fee, $30 per semester. (Academic year)

210 **Developmental Theories and Issues** (3) Staff
Orientation to the field of developmental psychology, with emphasis on traditional and contemporary theories, fundamental concepts and issues, and methodological approaches.

211 **Assessment of Cognitive Functioning** (3) Staff
Concepts of intelligence and achievement and their assessment through a variety of individual procedures. Material fee, $30. Admission by permission of instructor. (Summer)

213–14 **Seminar: Developmental Psychology** (3–3) Abravanel
Psyc 213: research and theory in developmental psychology, with topics drawn from cognitive, perceptual, and language functioning development. Psyc 214: current research and theoretical issues in social and personality development in childhood and adolescence. (Academic year)

216 **Developmental Psychopathology** (3) Ganiban
A comprehensive introduction to the field of developmental psychopathology. Origins, evolution, and long-term consequences of developmental psychopathology. Genetic and biological origins of psychopathology.

218 **Effective Interventions: Methods and Research** (3) Staff
Introduction to theory and technique of psychotherapeutic approaches of proven effectiveness. (Spring and summer)

223 **Seminar: Human Memory** (3) Staff
Selected topics of current research interest in the area of human memory. Emphasis on encoding and retrieval processes, amnesia, and disorders of memory.

225 **Behavioral Approaches to Child Assessment and Therapy** (3) Rohrbeck
Child assessment and treatment from a behavioral viewpoint. The application of conditioning, reinforcement, and shaping principles with reference to specific disorders of childhood.

226 **Seminar: Clinical Psychology of Childhood and Adolescence** (3) Frank
For graduate students in psychology; open to others with permission of instructor. Exploration of major topics concerning psychopathology in children and adolescents; discussion of nosological issues with emphasis on theoretical and research literature.

227–28 **Seminar: Principles of Psychotherapy** (3–3) Staff
For graduate students in clinical psychology; open to others with permission of instructor, if space permits. Patient's needs and demands on the therapist. Case participation heavily relied upon. Prerequisite: Psyc 218. (Alternate academic years)

229 **Seminar: Principles of Behavior Change** (3) Peterson
Behavioral learning methods and theory applied to clinical problems. (Fall)

231 **Development of Psychometric Instruments** (3) Moore
Quantitative techniques and principles used in construction, standardization, and evaluation of personality and ability measures for research and practice; quantification of human judgment for measurement purposes. Prerequisite: course in tests and measurements and an elementary course in statistics. (Fall)

235 **Seminar: Community Psychology** (3) Rohrbeck
For graduate students in the Department of Psychology; open to others, with permission of instructor, only if space permits. Survey of issues and techniques in community psychology; emphasis on educational systems and community psychology issues.

236 **Seminar: Minorities and Mental Health** (3) Zea
Factors affecting the mental health of minorities. Treatment considerations and differences in theoretical approaches with respect to minorities. (Spring)

237–38 **The Practice of General Psychology** (3–3) Staff
Application of psychological principles and findings to a wide spectrum of human problems. Professional issues facing the psychologist offering services. Participation in the development, implementation, and evaluation of applied psychological services and projects. (Academic year)

240 **Psychopathology** (3) Molock
Research and theory in psychopathology. (Fall)

241–42 **Family Systems: Theory, Practice, and Research** (3–3) Howe
Family dynamics and their implications for assessment and treatment. Special emphasis on the role of research in the process of evaluation of family systems and family therapy. Enrollment limited to advanced doctoral students in clinical psychology. (Academic year)

244 **Theories and Processes of Organizational Management** (3) Staff
Basic functions and techniques of organizational management—design, control, direction, and decision making—examined from the viewpoint of behavioral science.

245 **Seminar: Organizational Behavior** (3) Offermann
Analysis of organizational behavior; emphasis on motivation and productivity. Recent research on employee attitudes, primary group, supervisory leadership, formal and informal organization, job design. (Fall)

246 **Seminar: Personnel Evaluation Techniques** (3) Staff
Techniques of personnel selection and performance evaluation. Employment tests, personal data, assessment interviews, performance ratings, and assessment centers. Federal guidelines in employee selection. Includes practicum.

247 **Seminar: Psychology of Leadership in Organizations** (3) Offermann
Theories and issues related to the emergence and effectiveness of leaders, with focus on leadership behaviors and processes in organizations.

248 **Research Applications to Organizational Intervention and Change** (3) Staff
Emphasis on development of models of organizational effectiveness; design of valid diagnostic instruments; implementation of research strategies; establishment of program evaluation criteria. (Fall)

251 **Behavioral Neuroscience** (3) Rothblat
The neural basis of behavior, with special focus on the psychobiological determinants of learning, memory, and cognition. Methodologies used for different levels of analysis with normal and brain-impaired subjects.

253 **Social Cognition** (3) Staff
Social psychology theories, conceptual approaches, and their applications. Social cognition, person perception, attribution, information processing, attraction, stereotyping.

254 **Social Influence** (3) Offermann
Social psychology theories, conceptual approaches, and their applications. Analysis of intentional and unintentional social influence processes and their effects on behavior. Current research on conformity, social power, social exchange, and impression management.

255 **Attitudes and Attitude Change** (3) Poppen
Current theory and research on attitudes and attitude change.

256 **Introduction to Survey Research** (3) Poppen
Theory and practice of face-to-face telephone and mail surveys. Practical experience with all stages from the formulation of research questions and hypotheses to questionnaire design, sampling, pilot, testing, interviewing, coding, and data cleaning. Prerequisite: Stat 105 or equivalent. (Fall)

257 **Current Topics in Social Psychology** (3) Poppen
Advanced seminar with focus on major theoretical approaches, research, or problem areas within field of social psychology. Topic changes each semester. (Fall and spring)

259 **Psychology of Individual and Group Decision Making** (3) Moore
Examination of processes in organizational decision making and group behavior. Topics include group and individual decision-making approaches, decision aids and support systems, performance and decision effectiveness, and risk analysis.

260 **Psychology of Work Group Development** (3) Offermann
Examination of theory and research on groups as task performance systems. Approaches to team development as a means of improving work group effectiveness, including goal setting, role clarification, increasing interpersonal skills, and conflict resolution. (Spring)

263 **Evaluation Research** (3) Staff
Research issues and methods in evaluating the impact of organizational and social intervention and service programs. Specification of program goals and effectiveness criteria; measurement problems; experimental and quasi-experimental designs; political problems surrounding evaluation research. (Spring, even years)

268 **Seminar: Neuropsychology** (3) Rothblat
Selected problems in research relating the brain and behavior. Independent topics each semester, such as sensory processing, brain development and behavior, clinical aspects of nervous system function.

275 **Women and Health** (3) Zucker
same as WStu 275.

277 **Health Psychology** (3) Moore
Social psychological theories and research that relate to health and illness. Application of theories of social learning, attribution, attitude change, and social influence to topics such as health promotion and disease prevention, health compliance, and coping with illness and disability.

278 **Behavioral Medicine** (3) Peterson
The psychological causes, outcomes, and treatments for a wide variety of medical illnesses. Examination of research on the effectiveness of programs designed to promote health, to encourage compliance, and to foster lifestyle changes.

279 **Special Topics in Health Psychology** (3) Staff
May be repeated for credit provided the topic differs. Admission by permission of instructor.

281 **Clinical Neuropsychology I** (3) Rothblat
Analysis of experimental and clinical findings from studies attempting to localize and interpret human brain dysfunction, with emphasis on perceptual and cognitive behavior. Topics include overviews of neuroanatomy and neurological techniques, theoretical consideration of major neuropsychological disorders. Admission by permission of the instructor.

282 **Clinical Neuropsychology II** (3) Staff
Examination of important psychological procedures for the assessment of human brain dysfunction. Instruments and batteries such as the Bender-Gestalt, Wechsler Adult Intelligence Scale, Halstead-Reitan Neuropsychological Battery, and Luria's Neuropsychological Tests. Prerequisite: Psyc 211, 281, and permission of the instructor.

287 **Current Topics in Clinical Psychology** (3) Staff
Advanced seminar with focus on major theoretical approaches, research, or problem areas. Topics vary. May be repeated for credit.

288 **Current Topics in Industrial/Organizational Psychology** (3) Staff
Advanced seminar with focus on major theoretical approaches, research, or problem areas. Topics vary. May be repeated for credit.

289 **Seminar: Current Topics in Experimental Psychology** (3) Staff
Review and discussion of contemporary research and theory in a specialized field of psychological study, by leaders in the field. Independent topics each semester; may be repeated for credit. (Fall and spring)

291 **Theories of Organizational Behavior** (3) Staff
Examination of current theoretical models and research. (Spring)

295 **Independent Research** (3) Staff
Individual library or experimental research under supervision of staff member. Arrangements must be made with sponsoring faculty member prior to registration. May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy major field examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

PUBLIC POLICY AND PUBLIC ADMINISTRATION

Professors K.E. Newcomer (*Director*), G.M. Adams (*Practice*), W.C. Adams, E. Berkowitz, G. Brock, J.J. Cordes, R.S. Goldfarb, W.B. Griffith, M.M. Harmon, D.L. Infeld, P.G. Joyce, J.E. Kee, J.M. Logsdon, M. Raskin, S. Rosenbaum, G.D. Squires, C.H. Sterling, S.J. Trachtenberg, S.A. Tuch, N. Vonortas, P.W. Wirtz, H.L. Wolman, M.J. Worth
Associate Professors S.J. Balla, J.M. Brinkerhoff, D.S. Cropp, C. Deitch, E.J. Englander, C.E. Harrison, G.B. Jackson, J.F. Kasle, A.S. Malik, Y. Nakib, M. Starik, R.P. Stoker
Assistant Professor L.A. Brainard
Instructor D. Conger

Through its School of Public Policy and Public Administration, Columbian College of Arts and Sciences offers the Master of Public Policy, Master of Public Administration, and the Doctor of Philosophy in the field of public policy and administration. The master's programs provide academic preparation toward professional careers in government, business, and the nonprofit sector. In addition, a graduate certificate in nonprofit management is offered; three Master of Arts programs are affiliated with SPPPA (see below).

Master of Public Policy—Prerequisite: a bachelor's degree from a regionally accredited college or university.

Required: The general requirements stated under Columbian College of Arts and Sciences. The 40-credit-hour program consists of a six-course policy core (PPol 201, 202, 203, 204, 205 or 211, and 215); a three-course policy field; a course in public program evaluation and budgeting and a course in historical and ethical perspectives in public policy (each chosen from designated courses or approved by the advisor when specific to the selected policy field); and two electives chosen with approval of the advisor. Policy fields include business/government relations, education policy, environmental policy, gender and social policy, health policy, national security policy, nonprofit management, philosophy and social policy, program and policy evaluation, public budgeting and finance, public policy processes and institutions, science and technology policy, social policy, telecommunication policy, urban policy, and race, ethnicity, and public policy.

The Master of Public Policy is available in a dual degree program with the Ph.D. in the field of political science and a joint degree program with the J.D. in the GW Law School.

Master of Public Administration—Prerequisite: a bachelor's degree from a regionally accredited college or university.

Required: The general requirements stated under Columbian College of Arts and Sciences. The 40-credit-hour program includes a 25-credit core (PAd 201, 202, 203, 204, 205, 206, 208, and 209, a capstone seminar). Each student selects a three-course field chosen from budget and public finance; federal policy, politics, and management; international development management; managing in public organizations; managing state and local governments; nonprofit management; policy analysis and evaluation. Students may elect

such other three-course fields as strategic management and public policy, organizational behavior and development, information systems management, international business, health services administration, and management decision making. With approval, a special field may be constructed, tailored to the student's academic interests and career objectives. The remainder of the program consists of two elective courses chosen by the student with the advisor's approval from any related program or discipline.

The curriculum is accredited and provides graduate instruction in all areas recommended by the Guidelines and Standards for Professional Master's Degree Programs issued by the National Association of Schools of Public Affairs and Administration.

The Master of Public Administration is available in a joint degree program with the J.D. in the GW Law School.

Doctor of Philosophy in the field of public policy and administration—Required: the general requirements stated under Columbian College of Arts and Sciences, including (1) the prequalifying core curriculum: PPol 204, PPol 211 or Mgt 225, PAd 373 and 395, PAd 205 or Econ 222, PAd 225 or Phil 230, PSc 203 and 229; (2) a written qualifying examination; (3) an additional approved course in quantitative or qualitative research methods; (4) PPol 390 and 391; (5) a minimum of 18 hours in one of 14 policy or public administration fields: education policy; environmental and resource policy; gender and social policy; health policy; international development administration; labor market policy; national security policy; organizational, social, and political theory; program evaluation and measurement; public budgeting and finance; science and technology policy; telecommunications policy; urban policy; and race, ethnicity, and public policy; (6) a written examination in a policy or public administration field.

Columbian College of Arts and Sciences also offers affiliated interdisciplinary programs leading to the degrees of Master of Arts. The M.A. programs enable students to concentrate in a specific policy area, while completing courses in economics, politics, quantitative methods, and approaches to policy analysis.

Master of Arts in the field of public policy with a concentration in environmental and resource policy—See Environmental and Resource Policy.

Master of Arts in the field of public policy with a concentration in philosophy and social policy—See Philosophy.

Master of Arts in the field of public policy with a concentration in women's studies—See Women's Studies.

Note: Courses offered by or for the School of Public Policy and Public Administration may be limited to students enrolled in its programs. See the School of Business and the Elliott School of International Affairs for other graduate degree programs with public policy concentrations.

PUBLIC POLICY

201 **Politics and Public Policy** (3)
The role of policy analysts in public policymaking. The impact that the political, economic, cultural, and bureaucratic context has on the policymaking process and outcomes. Political and ethical issues raised by the intricate interface of the private, not-for-profit, and public sectors in public policy formulation and implementation. Same as PSc 229.

202 **Research Methods and Applied Statistics** (4)
Development of skills and knowledge for conducting original research and critically evaluating empirical studies. Various research designs and data collection techniques are examined. Focus on computerizing data sets for quantitative analysis, analyzing strength of relationships, selecting appropriate statistical techniques, and testing statistical hypotheses. Same as PAd 202.

203 **Policy Analysis** (3)
Development of skills in conducting and critiquing policy analyses. Application of methodologies used in analyzing possible consequences of specified alternatives as applied in the public policy decision-making process. Appropriate applications and limitations of policy analysis and its relationship to politics and the policy process. Same as PAd 206.

204 **Economics in Policy Analysis** (3)
The application of intermediate microeconomic theory to the study of public policy. Topics include: models of individual choice in policy analysis, policy aspects

of models of the firm, theory of market failure and welfare economics, and resource allocation decisions in the public sector. Prerequisite: Econ 217 or equivalent. Same as Econ 221; credit cannot be earned for PPol 204 and SMPP 206.

205 **Intermediate Qualitative and Quantitative Analysis** (3)
Theory and practice of research methodology, with a public policy emphasis. Qualitative and quantitative data sources and gathering, research models and designs, and analysis and interpretation.

207 **Environment, Energy, Technology, and Society** (3)
The identification, examination, and evaluation of how environment, energy, and technology are interrelated and how these interactions influence policy formulation and implementation at the international, national, regional, industrial, and organizational levels. Same as SMPP 207.

208 **Public Policy, Governance, and the Global Market** (3)
The socioeconomic foundations of government regulation and public policy cooperation for the governance of firms, markets, and globalization. The evolution of national, transatlantic, and multilateral frameworks for market and civil society governance, international competition policy cooperation, regulatory harmonization, and industry standards.

211–12 **Research Methods in Policy Analysis** (3–3)
PPol 211: Multivariate research methods in policy analysis; PPol 212: multivariate and causal modeling, experimental and quasi-experimental designs, and measurement issues. Prerequisite to PPol 211: PPol 202 or equivalent. Prerequisite to PPol 212: PPol 211 and Mgt 225.

215 **Capstone Seminar: The Ethics and Practice of Public Policy** (3)
Policy theory and typologies; policy formulation, implementation, and evaluation; ethics and practice in policy analysis, policy processes, content, and contexts; and policy linkages to multiple disciplines. Students submit an analysis of a substantive policy primarily utilizing resources in the D.C. region.

285 **Special Topics in Public Policy** (3)
Topics announced in the *Schedule of Classes*. May be repeated for credit, provided the topic differs.

298 **Independent Research** (arr.)
Prerequisite: Permission of instructor and program director.

385 **Advanced Special Topics in Public Policy** (3)
Topics announced in the *Schedule of Classes*. Limited to doctoral students or master's students with instructor approval. May be repeated for credit provided the topic differs.

390 **Philosophical Foundations of Policy Research** (3)
Philosophy of science as applied to research in public policy and public administration. Topics include the nature and current problems of epistemology, development and role of theories, and relationships among theory, methodology, and empirical data.

391 **Dissertation Workshop** (3)
Limited to doctoral candidates who have taken and passed the qualifying examination and completed all required course work in a policy or public administration field. Critical analysis of current research. Formulation of a dissertation proposal and development of dissertation research strategies.

398 **Advanced Reading and Research** (arr.)
Limited to students preparing for the Doctor of Philosophy general examination.

399 **Dissertation Research** (arr.)
Limited to Doctor of Philosophy candidates. May be repeated for credit.

PUBLIC ADMINISTRATION

201 **Public Administration and Management: Part I** (3) Harmon
An introduction to the important historical issues in the formation of the field of public administration and the American social/political context of its development. Focus upon traditional management roles, linked to central normative concerns of the field. (Fall)

202 **Research Methods and Applied Statistics** (4) Adams, Newcomer
Same as PPol 202.

203 **Federal Policy, Politics, and Management** (3) Kee, Cropp
Critical analysis of the structure and administration of the federal government from both a managerial and political perspective. Emphasis on executive branch

organization, integration, and coordination, as well as current trends in government regulation, accountability, and effectiveness. (Fall and spring)

204 **Public Administration and Management: Part II** (3) Brinkerhoff
Aspects of organizational and management practice, including issues of improvement/excellence, employee development and evaluation, small-group/team work, and efficiency/effectiveness/accountability as applied to public administration. Prerequisite: PAd 201. (Spring)

205 **Public Budgeting, Revenue, and Expenditure Analysis** (3 or 4) Joyce
Survey course that focuses on the institutions and analytical tools associated with raising revenue and allocating/managing resources at all levels of government. Hands-on budgeting skills and communication of analysis to decision makers. (Spring)

206 **Policy Analysis** (3) Infeld, Conger
Same as PPol 203.

208 **Public Administration and Management: Part III** (2) Staff
A practicum course enabling students to apply material from PAd 201 and 204 to the practice of public administration. Students with less than three years of administrative work experience will be required to participate in a supervised internship, while those with professional experience may choose an alternative format. Prerequisite: PAd 201 and 204. (Fall, spring, and summer)

209 **Public Administration and Management: Part IV** (3) Brainard
Review of the diverse concepts and issues in public administration; analysis and integration of ethical, political, economic, managerial, and personal values and issues in the field. Open only to M.P.A. degree candidates in their final semester of study; serves as a capstone seminar to the M.P.A. program. (Spring)

212 **Legislative Management and Congress** (3) Brainard
Analysis of Congress as a management system; examination of its internal administration and its role in formulating policy through legislation. Staffing practices, leadership, rules and procedures, oversight functions, and coalition building. (Fall)

214 **U.S. Competitiveness in the Global Economy—Trade and Investment Policy** (3) Brainard
Analysis of U.S. competitiveness in the postindustrial era focusing on the political economy of the U.S. in comparison with Western Europe and Japan. Emphasis on technology transfer, trade and investment policies, the state of the manufacturing sector, fiscal and monetary policy, and the role of government. (Spring)

215 **Law and the Public Administrator** (3) Kasle
Exploration and analysis of the functions of law in a democratic society. Emphasis is placed upon the procedural, historical, and jurisprudential dimensions of American law. This broad perspective seeks to convey understanding of the law as a legal and moral force guiding and constraining public decision making. (Spring and summer)

216 **Federal Government Regulation of Society** (3) Brainard
Analysis of the federal regulatory process as it affects the public and private sectors. The regulatory process from legal, economic, administrative, and political perspectives. (Spring)

217 **International Development Administration** (3) Brinkerhoff
An institutional and policy context for work in the international development industry. Mainstream policies, reform efforts, and alternative approaches. Major actors, selected policy areas, and regional and comparative perspectives. (Fall)

218 **International Development NGO Management** (3) Brinkerhoff
Provides an understanding of the primary implementation of international development assistance. Overview of NGO management, highlighting those features that are particular to NGOs active in international development. NGO management, government, and donors and North–South relations. (Spring)

219 **International Development Management Processes and Tools** (3) Brinkerhoff
Training in development management tools and processes; application of international development approaches specific to the development management profession. Key theories and perspectives of community development.

223 **Behavioral Factors in Complex Organizations** (3) Staff
Analysis of the nature and characteristics of human behavior in public organizations. Approaches to management and behavior in public organizations; small groups and teams. (Fall and spring)

224 **Managerial Leadership in Complex Organizations** (3) Kee
What the manager must know and do to provide leadership and guidance in large, complex organizations. An exploration of factors and processes that condition effective executive and managerial leadership. (Spring)

225 **Ethics and Public Values** (3) Harmon
Ethical dimensions of personal and professional judgments of public officials. Cases are used to consider the ethos of public organizations and the moral foundations of public policy. (Fall)

231 **Governing and Managing Nonprofit Organizations** (3) Worth
Historical, legal, and social foundations of the nonprofit sector. Developing organizational strategy and capacity; managing staff, boards, and volunteers; financial management; fund raising, marketing, public advocacy, and other external relations; partnerships and entrepreneurial activities; measuring performance; and policy issues.

232 **Managing Fund Raising and Philanthropy** (3) Worth
Fund-raising for nonprofit organizations and the management of relationships between donors and recipient organizations. Positioning the organization for fund raising; roles of staff and volunteers; principal techniques for identifying, cultivating, and soliciting donors; ethical principles; emerging trends; and relevant policy issues.

233 **Nonprofit Enterprise** (3) Worth
The use of business methods by nonprofit organizations, commercialization in the nonprofit sector, and the relationship between nonprofit and for-profit entities in pursuing social purposes. Case studies.

242 **Managing State and Local Governments** (3) Cropp
Examination of state and local governmental structures and functions, their place within the federal system, their revenue sources, their limitations, and the alternatives available to encourage more effective administration to meet public and private demands. (Fall)

243 **Land Use Planning and Community Development** (3) Staff
Theory and practice of land use planning. Issues of competing land uses in an era of increased sprawl, population pressure, and environmental threat. Growth management techniques and practices in states and localities; the use of various regulatory controls and economic incentives to achieve desired outcomes. The idea of "sustainable community." (Spring)

248 **Financing State and Local Government** (3) Kee
Analysis of the theory and practice of public finance in state and local governments. Includes the financing of services through municipal taxation, intergovernmental funds, debt instruments, and other revenue sources. Review of expenditures as well as financial management practices. (Spring)

249 **Urban and Regional Policy Analysis** (3) Cropp
Examination of selected national policies and their effects on urban areas and governments. Emphasis on policy dimensions of urban systems and their relationship to the social, political, and economic context. Against the background of urban politics and administration, areas of health, education, welfare, manpower, transportation, and housing are addressed. (Spring)

251 **Governmental Budgeting** (3) Joyce
Survey of the actors, institutions and processes in the U.S. budgeting system. Executive budget preparation/execution, legislative review and approval of budget requirements, and independent audit of government spending. (Fall)

253 **Financial Management in the Public Sector** (3) Staff
Intensive analysis, using the case study approach, of concepts and principles used in the not-for-profit sector for financial management purposes. Disciplines of accounting, budgeting, operations control, management, and auditing are integrated into comprehensive management control systems and include issues of system design and implementation. (Spring)

254 **Seminar in Public Budgeting and Tax Policy** (3) Joyce
Advanced seminar dealing with current budget and tax policy issues. Focus on student research projects that demonstrate detailed understanding of financial issues as they relate to recent fiscal trends and proposals included in current

budgets and revenue codes. Evaluation of tax regimes and budgeting policies, procedures, and processes. (Summer)

260 **Policy Formulation and Administration** (3) Staff
Impact of economic and political factors on public policy formulation and implementation; intensive analysis of the analytical, normative, and decision-making models of the policy process with special emphasis on their relationship to current policy problems. (Summer)

264 **Public and Nonprofit Program Evaluation** (3) Newcomer
Theory and practice of program evaluation and evaluative research. Exploration of scope and limitations of current practice in evaluation, considering economic, political, social, and administrative factors. Examination of methodological considerations for design, data collection, analysis, and dissemination. (Spring)

265 **Environmental Ethics** (3) Staff
Within the core issue of human obligations toward nonhuman beings and the natural world, specific issues include "intrinsic value in nature," the moral standing of animals and plants, and how nonhuman interests should be weighed in relation to human interests. Broader questions about the human place in nature.

266 **Environmental Policy** (3) Staff
Current issues in environmental policy: biodiversity, land use including wilderness protection, climate change, environmental justice, economic growth, and ecological sustainability.

267 **Current Topics in Public Policy** (1 to 3) Staff
Critical analysis of topical issues in public policy, using a case-study approach. Specific issues covered will vary. (Fall, spring, and summer)

290 **Special Topics** (3) Staff
Experimental course; new course topics and teaching methods. May be repeated once for credit.

296 **Statistical Applications in Public Administration** (3) Newcomer
Use of statistics, computers, and SPSS in research and program evaluations. Emphasis on interpretation and use of statistics. Development of basic statistical competency; frequency distribution, sampling, central tendency, variability, correlation, probability, regression. (Fall and spring)

298 **Directed Readings and Research** (3) Staff
Supervised reading in selected fields within public administration. Admission by permission of instructor. May be repeated once for credit.

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
Same as SMPP 311.

323 **Seminar: The Policy Organization** (3) Staff
Unique problems of complex organizations: public, private, and mixed. Emerging concepts and theories. Selected issues.

373 **Seminar: Public Administration and American Political and Social Institutions** (3) Staff
Contemporary and historical literature in the institutional and intellectual development of public administration. (Spring)

374 **Seminar: Trends in Public Organization Theory** (3) Harmon
Survey of contemporary normative and epistemological issues in public organization theory and practice. Analysis of the past and present influence of logical positivism, behaviorism, pragmatism, humanism, existentialism, phenomenology, and postmodernism. (Fall)

377 **Seminar: Foundations of Environmental Policy and Management** (3) Staff
Interdisciplinary approach to current issues in environmental policy and management. (Spring)

393 **Current Topics and Research** (1) Staff
Current scholarship discussed in a seminar setting. The conduct of research and presentation of research findings. May be repeated for credit.

395 **Research Methods** (3) Adams, Newcomer
Doctoral seminar on theory and practice in research methodology. Data sources and gathering, research models and designs. Critical evaluation of research studies. Emphasis on application of research methods to policy questions. (Spring)

397 **Doctoral Seminar** (1 to 3) Staff
398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.
399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

RELIGION

University Professor S.H. Nasr
Professors H.E. Yeide, Jr., D.D. Wallace, Jr., A.J. Hiltebeitel (*Chair*)
Associate Professors P.B. Duff, R.J. Eisen
Assistant Professor T. Michael

Master of Arts in the field of Hinduism and Islam—Through its Department of Religion, The George Washington University participates in this Consortium of Universities program. The degree requires 36 credit hours, of which a majority must be taken at GW. Candidates must meet the general requirements of Columbian College of Arts and Sciences, including the Master's Comprehensive Examination. Complete information on the program is available from Professors Nasr and Hiltebeitel of the Department of Religion.

Doctor of Philosophy in the field of American religious history—See History.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Special Topics in Religion** (3) Staff
May be repeated for credit provided the topic differs.
249 **Myth, Ritual, and Language** (3) Hiltebeitel
Method and theory in the interpretation of myth and narrative, ritual and sacrifice, and symbolism, with primary reference to the history of religions.
257 **India's Great Epics** (3) Hiltebeitel
The *Mahabharata* and the *Ramayana* are treated in alternate offerings of the course. These founding epic texts of devotional (bhakti) Hinduism are taught in English translation. Vernacular and performative versions of the epics and Western adaptations.
258 **Currents of Modern Hinduism** (3) Hiltebeitel
Hinduism since the early seventeenth century. Colonialism, the impact of missionaries, orientalism, reform, relations between Brahmanical and popular Hinduism, Sanskritic and vernacular traditions, regionalism, communalism, nationalism, fundamentalism, politicized "syndicated" Hinduism, and secularism.
260 **Topics in the Study of Islam** (3) Nasr
Study of sources and approaches to the investigation of Islam by both Western Islamicists and Muslim scholars, with discussion of the main controversial issues and differences in methods used by various schools of scholarship. Prerequisite: A course on Islam or permission of instructor.
261 **Topics in Islamic Thought** (3) Nasr
Perennial major issues in Islamic theology, philosophy, and Sufism such as Divine Unity, prophetology, eschatology, religious knowledge, sacred law, and ethics. Prerequisite: A course on Islam or permission of instructor.
271 **American Religion to 1830** (3) Wallace
Religious thought and life during the Colonial and early National periods.
273 **American Religion Since 1830** (3) Wallace
Religious thought and life from the Civil War to the present.
291–92 **Readings and Research** (3–3) Staff
Investigation of special problems.
299–300 **Thesis Research** (3–3)

ROMANCE LANGUAGES AND LITERATURES

270 **Seminar: Literary History** (3) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

271 **Seminar: Literary Criticism** (3) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

272 **Seminar: Literary Theory** (3) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

273 **Seminar: History of the Language/Linguistics** (3) Staff
Topic to be announced in the *Schedule of Classes*. May be repeated for credit provided the topic differs.

SECURITY POLICY STUDIES

Program Committee: G. Adams (*Director*), D. Avant, J. Hershberg, S. Johnson, J. Post, B. Powers, R. Spector, D. Shambaugh, J. Spear, K. Thachuk, W. Wise

Master of Arts in the field of security policy studies—This interdisciplinary program, offered by the Elliott School of International Affairs, prepares individuals for professional careers in international security and defense analysis.

Prerequisite: the admission requirements stated under the Elliott School of International Affairs and a bachelor's degree in a related field. Required: the general requirements stated under the Elliott School. The program consists of 40 credit hours in three fields. All students take three courses in the required core field of international security issues (IAff 253, Hist 230, PSc 249). The second field is chosen from U.S. national security policy and process; transnational security issues; defense policy and defense programs; conflict and conflict resolution; political psychology; homeland security; strategic concepts and military history; science, technology, and national security; or regional security. The third field may also be selected from the above, from other M.A. programs in the Elliott School, or designed in consultation with the program director. The three fields must represent at least two academic disciplines; no more than 21 hours of course work may be taken in any one department or discipline. Students should consult the program guidelines for specific course work within the fields.

Students must successfully complete Econ 280, 283, or 284; four 1-credit skills-based courses; and a 3-credit capstone course. The tool requirement must be satisfied by demonstration of proficiency in statistics or by demonstration of reading and oral proficiency in a modern foreign language by passing a language exam during the final 18 hours in residence.

In addition to the courses listed in the program guidelines, other courses may be taken with approval of the program director or an academic advisor.

700 SERIES

The 700 Series is made up of experimental or special courses that are on the cutting edge of the academic endeavor. Often, courses in the 700 Series focus on interdisciplinary or very current issues in a field. Courses range from freshman-level offerings to classes designed for seniors and graduate students. Unless the course description in the *Schedule of Classes* indicates that there are prerequisites or that an interview with the instructor is required prior to registration, all interested students are eligible to register, subject to their advisor's approval and the rules of the respective schools. Because 700 Series courses change each semester, students should consult the *Schedule of Classes* for offerings. Courses are listed with the participating departments; course descriptions appear in a specially designated section of the Schedule.

Courses numbered 701 are in general studies, 721 courses are interdepartmental, 751 courses are interschool, and 770s and 780s are taught by University Professors and are listed in this Bulletin under the designation of University Professors. The program is coordinated by the Executive Director of Academic Planning and Assessment.

SOCIOLOGY

University Professor A. Etzioni
Professors W.J. Chambliss, J.L. Tropea, S.A. Tuch, R. Weitzer, R.J. Cottrol, G.D. Squires (*Chair*)
Associate Professors H. Nashman, C. Deitch, M.A.P. Saunders
Assistant Professors C.E. Kubrin, I. Kennelly, D.S. Eglitis, F. Buntman, R. Penney, P. Davidson, L. Torres
Adjunct Professor C. Hartman

Adjunct Associate Professors R.B. Zamoff, L. Joseph
Adjunct Assistant Professors J.F. Markey, M. Mashayekhi
Assistant Professorial Lecturer K. Mulvey

Master of Arts in the field of sociology—Prerequisite: a bachelor's degree with a major in sociology or in an approved related field.

Required: the general requirements stated under Columbian College of Arts and Sciences. All students must complete at least 30 credit hours of graduate course work plus a thesis (Soc 299–300). The following courses are required for the degree: Soc 230, 231, 238, 239, and either 232 or 240; plus two courses in a major field and one course in a minor field. Currently available fields of specialization are social stratification, criminology, and urban sociology. With the consent of an advisor, one graduate course in a related department or program can be used for either one of the major courses or for the minor course requirement.

Master of Arts in the field of criminal justice—This program is a joint offering of the Department of Sociology and the Department of Forensic Sciences. Prerequisite: a bachelor's degree in criminal justice, criminology, or a related field.

Required: the general requirements stated under Columbian College of Arts and Sciences. All students must complete at least 30 credit hours of graduate course work plus a thesis (Soc 299–300) or 36 credit hours of graduate course work and a comprehensive examination. The following courses are required for the degree: Soc 230, 231, 258, 259, and either Soc 232 or 240; ForS 221, 222; five elective courses in criminal justice, of which at least one is in forensic sciences and at least one is chosen from Soc 260, 261, 262, 263, 264, 266. Students opting for a thesis substitute Soc 299–300 for two of the elective courses.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

230 **Sociological Research Methods** (3) Kubrin, Tuch, Davidson, Torres
Survey of the procedures, methods, and problems of contemporary sociological data collection, with an emphasis on survey methods. Major topics include research design, instrument construction, survey sampling, and measurement. (Fall)

231 **Data Analysis** (3) Kubrin, Tuch, Davidson
Intensive study of quantitative data analysis techniques, with strong emphasis on computer applications. Prerequisite: Soc 230. (Spring)

232 **Qualitative Methodology: Doing Field Research** (3) Chambliss, Weitzer, Penney
Practical application of data collection methods in natural settings; observation, participant observation, and field experience. Emphasis on implementing research projects by using these methods for purposes of developing empirically grounded theory. (Fall)

238 **Development of Sociological Theory** (3) Chambliss, Kennelly, Eglitis
Development of sociology from the early 1800s to the 1920s. Intensive analysis of the classical theoretical statements. (Fall)

239 **Contemporary Sociological Theory** (3) Kennelly, Eglitis
Intensive examination and evaluation of contemporary schools of sociological theory in Europe and America. Advanced analysis of theoretical perspectives. (Spring)

240 **Field Research in Organizational Settings** (3) Staff
Applications of field research techniques in formal organizational settings. Examination of the logic of qualitative inquiry and techniques of qualitative data collection. Intensive interviewing and participant observation in field settings are emphasized. (Fall)

244 **Sociology of Families and Kinship** (3) Staff
A systematic introduction to recent theoretical perspectives and empirical research on family patterns. The course combines a focus on how and why societal family patterns vary and change over time with an examination of how individuals vary in their experience of life course transitions, such as marriage, childbirth, employment, divorce, and retirement. (Fall)

245 **Race Relations** (3) Tuch, Squires, Torres
Systematic analysis of race relations and inequality, primarily in the United States. Topics include current status and recent trends in inequality, the insti-

tutional and organizational patterning of discrimination, the structure of racial attitudes, theoretical perspectives on race relations, and selected policy issues. (Spring)

246 **Comparative Race and Ethnicity** (3) Weitzer
Examination of race and ethnic relations in comparative, international perspective. Selected societies are analyzed in terms of patterns of racial and ethnic inequality, intergroup relations, institutional foundations of discrimination, social control systems, and sources of social change. (Spring)

248 **Race and Urban Redevelopment** (3) Squires
An examination of sociological forces shaping the development of metropolitan areas, racial inequality, and the intersections of urban development and race relations. Major theories of urban and metropolitan development and causes of racial inequality; major past and current public policies.

250 **Urban Sociology** (3) Squires, Davidson
Systematic analysis of urbanization and life within urban areas, primarily in the United States. Topics include theoretical perspectives on urban growth and neighborhood change, housing, the community question, neighborhood effects on individuals within the metropolis, and selected policy issues.

252 **Selected Topics** (3) Staff
Examination of selected topics of general importance to sociology. May be repeated once for credit. (Fall and spring)

254 **Evaluation Research** (3) Staff
Systematic survey of the conceptualization, design, and practice of evaluation research. Prerequisite: Soc 230. (Spring)

255 **Practicum in Applied Research** (3 or 6) Staff
Supervised sociological research through an internship in a local organization (e.g., a government agency, a non-governmental organization, or a research firm). The internship must be for at least 10 hours a week. Weekly seminar; final paper. Prerequisite: completion of all methodology requirements for the M.A. degree. (Fall, spring, and summer)

258 **Deviance and Control** (3) Kubrin, Tropea, Weitzer
Examination of major theories and research in the field of deviance and social control, with special emphasis on recent empirical advances and comparative perspectives. (Fall)

259 **Criminology** (3) Kubrin, Chambliss, Weitzer, Buntman
The status of various criminology theories. How the history and logic of science affect the scientific study of crime. Theories of crime causation and crime control; cross-cultural research on crime. (Spring)

260 **Special Topics in Criminal Justice** (3) Chambliss, Kubrin, Weitzer, Buntman
Examination of selected topics in criminal justice. May be repeated once for credit if the topic differs. (Fall and spring)

261 **Sociology of Law** (3) Chambliss, Tropea, Buntman
The development and use of law in complex societies, including the different roles of civil and criminal law. The role of the sociology of law within the discipline of sociology. (Spring)

262 **American Corrections** (3) Staff
Analysis of adult and juvenile correctional systems in the United States, including probation, parole, jails, and prisons. Topics include theoretical perspectives, the impact of corrections on crime rates, and evaluations of sentencing and other reforms. (Spring)

263 **Race and Crime** (3) Kubrin, Weitzer, Buntman
Examination of race, crime, and punishment in American society. Analysis of competing theoretical explanations for interracial differences in crime rates, and racial patterns in the apprehension, adjudication, and punishment of offenders. (Fall)

264 **Organized Crime** (3) Chambliss
The role of organized crime in the political economy of different countries, with emphasis on the development of organized crime networks in the United States. (Spring)

265 **Women, Welfare, and Poverty** (3) Deitch
Same as WStu 265.

266 **Gender and Criminal Justice** (3) Buntman
How understandings, practices, and theories of gender shape the workings of criminal justice systems, including issues of criminality and responses to

crime, victimization and violence, and definitions of illegal behaviors. Same as WStu 266.

268 **Race, Gender, and Class** (3) Deitch, Kennelly, Torres
How social structures are constructed through race, gender, and class and how they shape experience. The intersections of race, gender, and class in education, science, politics, labor markets, and social welfare policies. Same as WStu 268. (Spring)

271 **Gender and Society** (3) Kennelly, Eglitis, Torres
An examination of quantitative and qualitative research in the field of gender, with emphasis on current empirical research. (Fall)

272 **Theoretical Perspectives on Gender** (3) Kennelly, Eglitis, Torres
Review of significant theoretical writings on gender and gender inequality, with a primary focus on contemporary sociological statements. (Spring)

273 **The Sex Industry** (3) Weitzer
Sociological examination of prostitution, pornography, and other forms of sex work in the United States and internationally. Topics include theoretical perspectives, structure of the sex industry, workers' experiences, gender issues, political conflicts, and policy implications. (Spring)

286 **The Law of Race and Slavery** (3) Cottrol
Same as Hist 286.

290 **Principles of Demography** (3) Staff
Same as Econ/Geog/Stat 290.

291 **Methods of Demographic Analysis** (3) Staff
Same as Econ/Geog/Stat 291.

295 **Research** (arr.) Staff
Independent study and special projects. Before permission is granted to register for Soc 295, the student must submit a written plan of study for the approval of the staff member of the department who will be directing the research. May be repeated once for credit. (Fall, spring, and summer)

299–300 **Thesis Research** (3–3) Staff

SPECIAL EDUCATION

See **Teacher Preparation and Special Education.**

SPEECH AND HEARING SCIENCE

Professor C.W. Linebaugh
Associate Professors M.D.M. Brewer, G.M. Schulz (*Chair*), L. Bland-Stewart
Assistant Professors N.S. Richards, S. Brundage, J. Brown
Adjunct Professor B. Sonies
Assistant Professorial Lecturers M.E. Moody, M. Bamdad
Clinical Instructor L. Jacobs-Condit

Master of Arts in the field of speech–language pathology—Prerequisite: the degree of Bachelor of Arts with a major in speech and hearing science from this University, or an equivalent degree, and an appropriate score on the Aptitude Test of the Graduate Record Examination.

Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 40 credit hours of approved course work without a thesis or, with the approval of the department, 34 credit hours of approved course work plus a thesis (SpHr 299–300). All students must satisfy the academic and supervised practicum requirements of the Certificate of Clinical Competence awarded by the American Speech–Language–Hearing Association and satisfactorily complete the Master's Comprehensive Examination.

As one component of the Master's Comprehensive Examination, all students must take the National Examination in Speech Pathology available through the Educational Testing Service. Students must request the Testing Service to send copies of test scores to the Department of Speech and Hearing Science to be used in partial fulfillment of the general requirement in Columbian College for the Master's Comprehensive Examination. Test results must reach the department at least three weeks before graduation.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201 **Clinical Practicum in Speech–Language Pathology** (1 to 6) Bamdad
Supervised clinical practice in the evaluation and treatment of speech and language disorders; counseling of clients and families; development of treatment plans and writing of evaluation and progress reports. Admission by permission of the instructor. May be repeated for up to 6 credit hours. (Fall, spring, and summer)

202 **Clinical Practicum in Audiology** (1 to 6) Bamdad
Supervised clinical practice in behavioral and electrophysiologic assessment of hearing, hearing aid assessment and fitting, and aural rehabilitation; counseling clients and families; writing evaluation and progress reports. Admission by permission of the instructor. May be repeated, but may not be taken for more than 6 credit hours. (Fall, spring, and summer)

210 **Research in Communication Sciences and Disorders** (3) Staff
Review of fundamental issues and methods in clinical research, including group and single-subject experimental designs. Application of clinical research methodology and findings to assessment and treatment. Development of a research prospectus. Laboratory fee, $12. (Spring)

220 **Disorders of Articulation and Phonology** (3) Staff
Survey of the nature and causes of impairments of speech sound production in children and adults. Differential diagnosis of oral motor versus phonological disorders; treatment approaches; identification and modification of regional dialects and foreign accents. Laboratory fee, $12. (Spring)

221 **Neurodevelopmental Disorders of Speech Production** (2) Staff
Evaluation and treatment of infants and children with neurodevelopmental speech disorders, including cerebral palsy. Emphasis on management of pre-speech oral motor and feeding impairments. Laboratory fee, $12. (Summer)

222 **Acquired Neuromotor Disorders of Speech Production** (2) Schulz
Examination of the neuroanatomical and neurophysiological bases and acoustic and perceptual characteristics of acquired dysarthrias and apraxia of speech. Evidence-based approaches to the assessment, differential diagnosis, and treatment of these disorders. Laboratory fee, $12. (Summer)

230 **Pediatric Language Impairments I** (3) Bland-Stewart
Survey of current approaches for assessing and treating language delays and disorders in infants, toddlers, preschoolers, school-age children, and adolescents. Review of standardized, observational, and ethnographic approaches used in language assessment; current models of intervention and service delivery. Laboratory fee, $12. (Fall)

231 **Pediatric Language Impairments II: Early Intervention** (2) Staff
Theoretical and practical approaches for assessing and treating speech and language impairments in infants, toddlers, and preschool children. Methods used in family needs assessment, Individualized Family Service Plans, ethnographic and dynamic assessment; multidisciplinary team functioning. Laboratory fee, $12. (Fall)

232 **Pediatric Language Impairments III: School-Age Populations** (2) Bland-Stewart
Theoretical and practical approaches for identifying, assessing, and managing language-learning impairments in school-age children, including specific language impairments and attention-deficit disorders. School-based service delivery models, IEPs, multidisciplinary collaborative programming. Laboratory fee, $12. (Summer)

240 **Neurogenic Communication Disorders** (3) Brundage
Differential diagnosis of acquired speech and language disorders, with an emphasis on the aphasias acquired in adulthood. Evidence-based approaches to the assessment and treatment of adult neurogenic language disorders. Laboratory fee, $12. (Fall)

241 **Applied Neuroanatomy** (3) Schulz
Neuroanatomy and neurophysiology of systems underlying speech, language, and hearing. Neuroimaging techniques and investigations. Applications to the assessment and treatment of communication disorders. Laboratory fee, $12. (Fall)

251 **Seminar: Speech Fluency Disorders** (3) Brundage
Consideration of stuttering and other disorders of speech rate and rhythm from developmental, linguistic, physiological, and psychosocial points of view.

Investigation of evidence-based approaches to assessment and treatment. (Summer)

260 **Voice Disorders: Evaluation and Treatment** (3) Staff
Normal anatomy and physiology of the human vocal mechanism. Nature, causes, and clinical management of functional and organic voice disorders, including laryngectomy. Laboratory fee, $12. (Fall)

276 **Aural Rehabilitation** (3) Brewer
Habilitation/rehabilitation of the hearing impaired, including auditory training, speech reading, hearing aids, assistive listening devices, communication strategies, and counseling. Laboratory fee, $12. (Fall)

277 **Psychoeducational Management of Children With Hearing Impairment** (3) Brewer
Study of the psychosocial and educational effects of hearing loss. Assessment, remediation, and management approaches related to the education of the hearing impaired. Laboratory fee, $12. (Summer)

281 **Dysphagia** (2) Sonies
Anatomy and physiology of normal swallowing. Nature and causes of dysphagia in adults. Assessment, including clinical examination and radiologic methods; treatment. Laboratory fee, $12. (Spring)

282 **Augmentative Communication and Computer Applications in Communication Disorders** (2) Staff
Principles of assessment, development, and selection of augmentative and alternative communication systems; application through case studies. Computer applications, including review of selected hardware and software and selection criteria. Laboratory fee, $20. (Summer)

283 **Multicultural Perspectives in Communication Development and Disorders** (3) Bland-Stewart
Application of culturally appropriate and theoretically based speech and language procedures to clinical assessment and intervention with multilingual/multicultural populations. (Spring)

290 **Selected Topics in Clinical Audiology** (1 to 3) Staff
Advanced study of selected theoretical and clinical issues. May be repeated, but may not be taken for more than a total of 6 credits. (Fall, spring, and summer)

291 **Selected Topics in Speech–Language Pathology** (1 to 3) Staff
Advanced study of selected theoretical and clinical issues regarding various aspects of practice in speech–language pathology. May be repeated but not for more than a total of 6 credit hours. (Fall, spring, and summer)

295 **Independent Research in Speech, Language, and Hearing** (arr.) Staff

299–300 **Thesis Research** (3–3) Staff

STATISTICS

Professors J.L. Gastwirth, N.D. Singpurwalla, J.M. Lachin III, H.M. Mahmoud, T.K. Nayak (*Chair*), Z. Li, J. Chandra (*Research*), R.L. Launer (*Research*)
Associate Professors S. Bose, R. Modarres, E. Bura
Assistant Professors C. Tatsuoka, K. Ghosh, S. Kundu, S. Balaji, Y. Lai
Professorial Lecturers F. Ponti, P. Chandhok, J. Wu
Associate Professorial Lecturers R.F. Teitel, C.M. Fleming
Lecturer H. Modarres

Master of Science in the field of statistics—General prerequisite: course work in multivariate calculus, matrix theory, and at least two undergraduate statistics courses.

Required: The general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 30 credit hours of graduate course work without a thesis. The department may also approve a program of study consisting of 24 credit hours of course work plus a thesis (Stat 299–300). All candidates must take Stat 201–2. Courses may be chosen in related fields (economics, mathematics, finance, management, computer science, engineering, public health) with approval of the advisor. Candidates must pass a written Master's Comprehensive Examination covering material taught in Stat 201–2 and in three additional graduate statistics courses chosen by the student and approved by the program director.

Doctor of Philosophy in the field of statistics—Prerequisite: A master's degree in statistics or a related discipline. The main requirement is a strong background in mathematics,

including courses in advanced calculus, linear algebra, and mathematical statistics. Some deficiencies may be made up concurrently during the student's first year. In some instances, a student may enter the Ph.D. program with a bachelor's degree.

Required: The general requirements stated under Columbian College of Arts and Sciences, including satisfactory completion of (1) Stat 201–2, 217–18, 223 or 271, 257, 258, 263, 264, and at least two courses chosen from among Stat 262, 265–66, and 273–74; (2) a minimum of 15 additional credit hours as determined by consultation with the departmental doctoral committee; (3) the General Examination, consisting of two parts: (a) a written qualifying examination that must be taken within 24 months from the date of enrollment in the program and is based on Stat 201–2, 257, and 263 and (b) an examination to determine the student's readiness to carry out the proposed dissertation research; and (4) a dissertation demonstrating the candidate's ability to do original research in one of the following fields: Bayesian inference, biostatistics, design of experiments, multivariate analysis, nonparametric statistics, probability (theoretical or applied), reliability theory, robust methods, sampling, statistical computing, statistical inference, stochastic processes, and time series.

Master of Science and Doctor of Philosophy in the fields of biostatistics and epidemiology—See Biostatistics and Epidemiology.

In addition to its degree programs, the Statistics Department offers a graduate certificate in survey design and data analysis.

With permission, a limited number of 100-level courses in the department may be taken for graduate credit; additional course work is required. See the Undergraduate Programs Bulletin for course listings.

201–2 **Mathematical Statistics** (3–3) Ghosh, Mahmoud
Distribution theory, sampling theory, estimation, sufficient statistics, hypothesis testing, analysis of variance, multivariate normal distribution. Prerequisite: Math 33, 124. (Academic year)

207 **Methods of Statistical Computing I** (3) Modarres
Error analysis, computational aspects of linear models, sweep operator, random number generation, simulation, resampling. Optimization, numerical integration (Gaussian quadrature, Simpson's rule); E–M algorithm. Prerequisite: Stat 118, 157–58; Math 124; knowledge of a programming language.

208 **Methods of Statistical Computing II** (3) Modarres
Numerical linear algebra, matrix decomposition and eigenvalue problems. Smoothing and density estimation. Graphics, interactive and dynamic techniques for data display. Object-oriented programming. Prerequisite: Stat 118, 157–58; Math 124; and knowledge of a programming language.

210 **Data Analysis** (3) Lachin
Review of statistical principles of data analysis, using computerized statistical procedures. Multiple regression and the general linear model, analysis of contingency tables and categorical data, logistic regression for qualitative responses. Prerequisite: Stat 118, 157 or 201, and 183 or equivalent. (Spring)

213 **Intermediate Probability and Stochastic Processes** (3) Li
Discrete and continuous random variables and their distributions, conditional distributions and conditional expectation, generating functions and their applications, convergence of random variables; introduction to Brownian motion, homogeneous and nonhomogeneous Poisson processes and martingales. Prerequisite: Stat 201–2 or equivalent. (Spring, alternate years)

214 **Applied Linear Models** (3) Bura
Introduction to regression techniques for discrete and continuous response variables. The course includes a computing component using SAS and S+. Prerequisite: Math 33 and 124. (Fall, alternate years)

215–16 **Applied Multivariate Analysis** (3–3) Bura, Modarres
Application of multivariate statistical techniques to multidimensional research data from the behavioral, social, biological, medical, and physical sciences. Prerequisite: Stat 119, 157–58; Math 124. (Alternate academic years)

217 **Design of Experiments** (3) Bura
Design and analysis of single- and multiple-factor experiments. Includes block designs, repeated measures, factorial and fractional factorial experiments, response surface experimentation. Prerequisite: Stat 157–58; Math 124. (Fall, alternate years)

218 **Linear Models** (3) Kundu
Theory of the general linear parametric model. Includes least squares estimation, multiple comparisons procedures, variance components estimation. Prerequisite: Stat 201–2; Math 124. (Spring, alternate years)

221 **Design of Experiments for Behavioral Sciences** (3) Tatsuoka
Applications of advanced experimental design to research problems in behavioral sciences and education. Prerequisite: Stat 105 or 118 or equivalent and permission of instructor. Not open to graduate students in mathematical statistics. (Spring)

223 **Bayesian Statistics: Theory and Applications** (3) Singpurwalla, Bose
An overview of Bayesian statistics, including its foundational issues, decision under uncertainty, linear models, expert opinion, and computational issues. Prerequisite: Stat 201–2. (Spring, alternate years)

224 **Design of Medical Studies** (3) Staff
Design of medical investigations, including the randomized clinical trial, observational cohort study, and retrospective case-control study. Specific methods regarding sample size, power and precision, and statistical procedures for randomization and sampling. Ethics of clinical trials and the intention-to-treat principle. Prerequisite: Stat 201 or 157. (Spring)

225 **Biostatistical Methods** (3) Lachin, Li
Biostatistical methods for asymptotically efficient tests and estimates of relative risks and odds ratios from prospective and retrospective matched and unmatched studies. Fixed and random effects models. Logistic, conditional logistic, and Poisson regression models. Maximum likelihood and efficient scores. Prerequisite: Stat 201–2 or permission of instructor. (Fall)

226 **Advanced Biostatistical Methods** (3) Li
Statistical methods for the analysis of longitudinal data: nonparametric, fixed effects, mixed effects, generalized estimating equations. Methods for the analysis of emerging data: group sequential analysis, Brownian motion, Bayesian methods, and stochastic curtailment. Other advanced topics of current research in biostatistics. Prerequisite: Stat 201–2 or permission of instructor. (Spring)

227 **Survival Analysis** (3) Ghosh, Li
Parametric and nonparametric methods for the analysis of events observed in time (survival data), including Kaplan–Meier estimate of survival functions, log-rank and generalized Wilcoxon tests, the Cox proportional hazards model and an introduction to counting processes. Prerequisite: Stat 201–2 or permission of instructor. (Fall)

231 **Categorical Data Analysis** (3) Kundu
A study of the theoretical bases underlying the analysis of categorical data. Measures and tests of association; Mantel-Haenszel procedure; weighted least squares and maximum likelihood estimators in linear models; estimating equations; logistic regression; loglinear models. Prerequisite: Stat 201–2. (Fall, alternate years)

242 **Regression Graphics/Nonparametric Regression** (3) Bura
Linear regression, nonparametric regression, smoothing techniques, additive models, regression trees, neural networks, and dimension reduction methods. Prerequisite: Stat 118; Math 33, 124, or equivalent. (Spring, alternate years)

257 **Probability** (3) Balaji, Mahmoud
Probabilistic foundations of statistics, probability distributions, random variables, moments, characteristic functions, modes of convergence, limit theorems, probability bounds. Prerequisite: Stat 201–2, knowledge of calculus through functions of several variables and series. (Fall)

258 **Distribution Theory** (3) Gastwirth, Mahmoud
Special distributions of statistics, small and large sample theory, order statistics, and spacings. Prerequisite: Stat 257. (Spring)

259 **Advanced Probability** (3) Mahmoud
Conditional expectation and martingales; weak convergence in general metric spaces and functional central limit theorems for i.i.d. random variables and martingales; applications to biostatistics. Prerequisite: Stat 257 or an equivalent measure-theoretic introduction to probability.

262 **Nonparametric Inference** (3) Kundu
Inference when the form of the underlying distribution is unspecified. Prerequisite: Stat 201–2.

263 **Advanced Statistical Theory I** (3) Nayak, Bose
Decision theoretic estimation, classical point estimation, hypothesis testing. Prerequisite: Stat 201–2. (Fall)

264 **Advanced Statistical Theory II** (3) Nayak, Bose
Asymptotic theory, hypothesis testing, confidence regions. Prerequisite: Stat 257, 263. (Spring)

265 **Multivariate Analysis** (3) Nayak
Multivariate normal distribution. Hotelling's T^2 and generalized T_0^2, Wishart distribution, discrimination and classification. Prerequisite: Stat 201–2. (Fall, alternate years)

266 **Topics in Multivariate Analysis** (3) Nayak
Multivariate analysis of variance, principal components, canonical correlation, factor analysis. Prerequisite: Stat 265. (Spring, alternate years)

271 **Foundational and Philosophical Issues in Statistics** (3) Singpurwalla
Axiomatic underpinnings of Bayesian statistics, including subjective probability, belief, utility, decision and games, likelihood principle, and stopping rules. Examples from legal, forensic, biological, and engineering sciences. Students are expected to have a background in computer science, economics, mathematics, or operations research. Prerequisite: Stat 201–2.

273–74 **Stochastic Processes** (3–3) Mahmoud, Singpurwalla
Fundamental notions of Markov chains and processes, generating functions, recurrence, limit theorems, random walks, Poisson processes, birth and death processes, applications. Prerequisite: Stat 201–2. (Alternate academic years)

275 **Econometrics I** (3) Staff
Same as Econ 375.

276 **Econometrics II** (3) Staff
Same as Econ 376.

281 **Advanced Time Series Analysis** (3) Balaji
Autoregressive integrated moving average (ARIMA) modeling and forecasting of univariate and multivariate time series. Statespace or Kalman filter models, spectral analysis of multiple time series. Theory and applications using the University computer. Prerequisite: Math 33, Stat 201–2 or equivalent. (Spring)

287–88 **Modern Theory of Sample Surveys** (3–3) Chandhok
Application of statistical theory to the sampling of finite populations. Simple, stratified, cluster, double and subsampling. Special topics, including superpopulations and randomized response. Prerequisite: Stat 157–58 or equivalent. (Academic year)

289 **Seminar** (3) Staff
Admission by permission of instructor.

290 **Principles of Demography** (3) Staff
Same as Econ 290.

291 **Methods of Demographic Analysis** (3) Staff
Same as Econ 291.

295 **Reading and Research** (3) Staff
May be repeated once for credit.

299–300 **Thesis Research** (3–3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to students preparing for the Doctor of Philosophy general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to Doctor of Philosophy candidates. May be repeated for credit.

STRATEGIC MANAGEMENT AND PUBLIC POLICY

Professors H.J. Davis, W.H. Becker, D.J. Lenn
Associate Professors J.B. Thurman (*Chair*), J. Cook, E.J. Englander, J.H. Beales III, M. Starik, L. Burke, J. Griffin, B.S. Teng
Assistant Professors D.R. Kane, J.W. Geranios, J. Rivera
Professorial Lecturer W.N. LaForge

See the School of Business for programs of study in business administration leading to the degrees of Master of Business Administration and Doctor of Philosophy.

202 **Business–Government Relations** (3) Englander, Becker
Historical and philosophical foundations of the business–government relationship. Regulation, international trade, and corporate political activities. Public policy issues facing business and the business community's political response. Prerequisite: MBAd 260 or equivalent. (Fall)

205 **Business Representation and Lobbying** (3) Staff
Strategies, tactics, and techniques used by business in representing itself to the legislative and executive branches and regulatory agencies of the federal government. Legal and practical constraints. Ethical considerations. (Spring)

206 **Applied Microeconomics** (3) Beales and Staff
Applications of economic theory to public and private decisions with emphasis on public policy analysis. Focus on market structure and its implications. Imperfect information, common property, public goods and externalities. Economic analysis of government behavior and legal institutions. Prerequisite: Econ 217 or 219 and MBAd 220 or equivalent. (Fall)

207 **Environment, Energy, Technology, and Society** (3) Starik
Same as PPol 207.

208 **Macroeconomic Policy and Business** (3) Staff
Determination of national income, employment, inflation, and interest rates. The role of expectations in the economy. Impact of government purchases, tax policy, and deficits. Monetary policy institutions. The global economy and exchange rates. Prerequisite: Econ 218 or 219 and MBAd 220 or equivalents. (Fall)

209 **Seminar: Business Economics and Public Policy** (3) Englander, Becker
Analysis and discussion of selected issues by students and representatives of government and business. Prerequisite: SMPP 202 or MBAd 260 or equivalent. (Spring)

210 **Strategic Environmental Management** (3) Starik
Examination and analysis of the orientation and actions of private, public, and nonprofit sectors in relation to their natural environments. Emphasis on organizational interaction and effectiveness, particularly regarding business firms and industry, on issues of environmental quality and sustainability. (Spring)

211 **Business Law: Contracts, Torts, and Property** (3) Staff
Same as Accy 211.

212 **Business Law: Enterprise Organization** (3) Staff
Same as Accy 212.

213 **Management of Strategic Issues** (3) Staff
The body of management theory and practice that has evolved to identify, analyze, and resolve strategic organizational issues. Methodology of the field; applications to critical issues in labor relations, energy and pollution, marketing and consumerism, business–government relations, and the global economy.

290 **Special Topics** (3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

291 **Ethics and Business** (3) Lenn, Starik
An in-depth, comprehensive exploration, analysis, and evaluation of specific for profit and non-profit organization values, approaches, and outcomes related to multiple ethical ideals, systems, and practices. (Spring)

293 **American Business History** (3) Becker
The history of American business institutions in manufacturing, distribution, transportation, and finance. Particular attention will be given to the period since industrialization, with consideration of business institutions in their economic, legal, governmental, and social contexts. Same as Hist 220. (Fall)

298 **Directed Readings and Research** (3) Staff
Supervised readings or research. Admission by prior permission of instructor. May be repeated once for credit. (Fall and spring)

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

311 **Seminar: Public–Private Sector Institutions and Relationships** (3) Staff
An analysis and critique of alternative theoretical frameworks for describing, understanding, and predicting the nature, values, and actions of American public and private institutions. Problems, potentials, and alternatives for structuring public and private institutional arrangements to meet the needs of society. Prerequisite: doctoral degree candidate status. (Fall and spring)

321 **Seminar in Strategic Management** (3) Staff
Develops understanding of the major research streams in strategic management; exposure to theoretical research frameworks and methodological issues and approaches.

331 **Seminar in Business and Public Policy** (3) Staff
Develops understanding of the major research streams in business and public policy; exposure to theoretical research frameworks and methodological issues and approaches.

391 **Seminar: Business Management** (3) Staff
Examination of major current issues, both theoretical and empirical, affecting the development of the business enterprise. Topics to be announced. Emphasis on policy and strategic issues affecting the total enterprise. (Offered as the demand warrants)

397 **Doctoral Seminar** (1 to 3) Staff

398 **Advanced Reading and Research** (arr.) Staff
Limited to doctoral candidates preparing for the general examination. May be repeated for credit.

399 **Dissertation Research** (arr.) Staff
Limited to doctoral candidates. May be repeated for credit.

TEACHER PREPARATION AND SPECIAL EDUCATION

Professors J.R. Shotel (*Chair*), M.S. Castleberry, R.N. Ianacone, A.J. Mazur, M.B. Freund, L.L. West, J.M. Taymans, N.B. Paley, C.A. Kochhar, S.J. Lynch, A.U. Chamot
Associate Professors S.S. Beck, K.A. Steeves, M.H. Jarrett, C. Green, C.L. Pyke
Assistant Professors P.S. Tate, B.C. Browne (*Research*), P.J. Leconte (*Research*), J.A. Glazier, N.B. Milman, J. Comas, E.K. Rice, J. Ruoff (*Research*)
Associate Professorial Lecturers J.L. Embich, G. Oran
Assistant Professorial Lecturers J. Marston, S. King, J. Illera, C. Wallin, D. Bello, K. Tindle, C. Weidenthal, C. Ohlson
Lecturers A. Biggins, K. Barron, K. Ihrig, W. Peterson

See the Graduate School of Education and Human Development for programs of study leading to the degrees of Master of Arts in Education and Human Development, Master of Education, and Doctor of Education.

TEACHER EDUCATION

Department prerequisite: A bachelor's degree from an accredited institution is prerequisite to all 200-level courses in teacher education.

204 **Perspectives in American Education** (3) Beck, Paley
Historical and social development of education in the United States; evolution of American education related to the growth of the nation and the changing social order; examination of selected issues in contemporary education.

205 **Foundations of Curriculum Development: K–12** (3) Paley
For experienced teachers. Examination of the educational ideas of individuals and groups that have influenced American curriculum theory and practice from the Progressive era through the twentieth century. Comparisons of the issues, models, and principles that have guided curricular thought, development, and innovation. (Summer)

206–7 **Teaching and Learning** (3–3) Beck, Pyke, Milman
An overview of the principles of teaching, learning, and related research. Explores ways of knowing, models of teaching, classroom management, and the dynamic nature of the teaching/learning process. Structured observations and microteaching labs are required. Material fee, $10 per semester.

208 **Development and Diversity** (3) Green, Steeves, Glazier
An examination of student diversity in relation to theories of human growth and development. Investigation of diverse student strengths and needs; the special needs population; the dynamics of inclusion; and intercultural issues related to the teaching/learning process. Material fee, $20.

209 **Reading Children's Literature Across the Curriculum** (3) Tate
Participants read and analyze multicultural children's literature (from folktale to nonfiction) while simultaneously practicing discussion, dramatization, art,

and writing response strategies suitable for involving all students and integrating literature across the school curriculum. (Spring)

211 **Elementary School Curriculum and Methods** (3) Beck, Green
A comprehensive block course with subsections in mathematics, science, language arts, and social studies. Integrated with TrEd 235. May be repeated for credit up to 15 hours; with permission, up to four blocks (to a total of 12 credits) may be taken in one semester. Admission by permission of advisor. Material fee, $10 per subsection. (Fall)

215 **Recent Developments in Teaching English** (3) Glazier
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective teaching of English. Admission by permission of instructor. Material fee, $20. (Summer)

216 **Recent Developments in Teaching Social Studies** (3) Steeves
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective teaching of social studies. Admission by permission of instructor. Material fee, $20. (Summer)

217 **Recent Developments in Teaching Science** (3) Lynch
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective teaching of science. Admission by permission of instructor. Material fee, $20. (Summer)

218 **Recent Developments in Teaching Mathematics** (3) Pyke
For experienced educational personnel. Research, techniques, materials, and innovative programs relating to the effective teaching of mathematics. Admission by permission of instructor. Material fee, $20. (Summer)

219 **Recent Developments in Teaching Computer Science** (3) Milman
Research techniques, materials, and innovative programs relating to the effective teaching of computer science. Prerequisite: TrEd 208, 244, 245, 291. Material fee, $20.

220 **Selected Topics** (arr.) Staff
Topics and fees announced in the *Schedule of Classes*.

221 **Developmental Reading: Emergent Literacy** (3) Comas, Mazur
For educators interested in helping young children get a successful literacy start. Seminar discussions focus on research into the sociocultural context of early literacy development, the nature of emergent reading and writing behaviors, and implications for establishing "literate environment" preschool and kindergarten classrooms. (Fall and spring)

222 **Foundations of Reading Development** (3) Comas
Basic theories and processes of reading acquisition and assessment; linguistic, cognitive, developmental, social, and affective bases of reading; influences of media, instructional strategies, including formal and informal assessment. (Fall)

223 **Reading Instruction in Content Areas: Elementary, Intermediate, and Secondary Schools** (3) Comas
Emphasis on acquisition and continuing development of content literacy, including integrated methods, media, and teaching demonstrations. (Fall)

224 **Diagnostic Teaching of Reading: K–6** (3) Comas
Classroom teaching and assessment strategies for elementary teachers; construction of informal traditional and non-traditional reading and writing tests; other instruments of evaluation; selecting and planning activities suitable to specific problems. Prerequisite: at least one previous course in reading. (Spring)

226 **Diagnostic Teaching of Reading in Secondary School** (3) Comas
Application of instructional strategies and techniques presented in TrEd 223 and 224. Construction of informal tests; administering, scoring, and interpreting informal and standardized tests; study and evaluation of materials; teaching strategies for on-grade students and for those with reading problems. (Spring)

227 **Teaching Reading and Writing in English as a Second Language** (3) Chamot
An emphasis on acquisition and continuing development of content literacy, including integrated methods, media, and teaching demonstrations geared toward second language learning requirements. Material fee, $10. (Spring)

228 **Instructional Areas in Elementary Education** (3) Beck
Current trends and research in reading, language arts, social studies, mathematics, science, music, art and physical education.

229 **Current Issues in Elementary Education** (3) Beck
Identification, definition, and analysis of some of the most important problems facing the contemporary American elementary school.

232 **Professional Internship in Middle School Education** (3 to 6) Glazier, Lynch, Pyke, Steeves
Supervised internship in middle schools; required seminar. Admission by permission of instructor. Material fee, $15. (Fall and spring)

234 **Professional Internship in Secondary Education** (3 to 6) Glazier, Lynch, Pyke, Steeves
Supervised internship; required seminar. Admission by permission of instructor. Material fee, $15 per credit hour. (Fall and spring)

235 **Professional Internship in Elementary Education** (3 to 6) Beck, Green, Tate
Supervised internship; required seminar. Admission by permission of instructor. Material fee, $15 per credit hour. (Fall and spring)

236 **Analysis of Teaching** (3) Rice
Teaching viewed as a system; component aspects are examined with a view toward developing a critical method of analysis. Material fee, $25. (Spring)

237 **Practicum in Early Childhood Education** (3 to 6) Staff
Supervised professional activity in selected early childhood programs; seminar. Prerequisite: 12 credit hours in early childhood education and permission of instructor. (Fall and spring)

238 **Clinical Practicum in Reading** (3 to 6) Comas
Supervised clinical experience, including observation and participation, in testing, tutoring, and teaching. Clients may include preschoolers through adults. Minimum of 120 clinic hours required. Admission by permission of instructor. Material fee, $25.

239 **Practicum in Curriculum and Instruction** (3 to 6) Staff
Supervised field experience in curriculum. Admission by permission of instructor. Prerequisite: TrEd 205. (Fall and spring)

240 **Teacher Leadership in Education** (3) Steeves
From the perspectives of educational theory and practice, the ideals and realities of contemporary public school teaching are viewed within a system of local, state, and federal organizations, with the goal of enhancing the role of teachers as knowledgeable and effective leaders in their profession. Prerequisite TrEd 204, 208, or equivalent. Material fee, $20. (Spring)

244 **Educational Technology and Computer Literacy Methods** (3) Milman
Computers and related technologies in educational settings. Using national technology standards for teachers as a framework, the course combines discussion of key issues related to technology in education, demonstration of technology-related instructional methods, and hands-on computer use and materials development. Prerequisite: TrEd 206, 207. Material fee, $20.

245 **Teaching Computer Science in Secondary Schools** (3) Staff
Issues in planning, curriculum, instruction, and developing accountability for all students as computer science learners. How to make computer science accessible and useful to young people. Computer science education explored as it is practiced in local area schools. Prerequisite: TrEd 206, 207. Material fee, $20.

TrEd 246 through 251 offer theoretical, curricular, and practical considerations for teaching the content area concerned. Each course requires a 30-hour field experience in a secondary classroom. Prerequisite: TrEd 206–7 and the approved certification course work in the content area (math through calculus in the case of TrEd 250). Material fee, $10 per course. Each course is offered in the fall semester.

246 **Teaching English in Secondary Schools** (3) Glazier
247 **Teaching Science in Secondary Schools** (3) Lynch
248 **Teaching Social Studies in Secondary Schools** (3) Steeves
249 **Teaching Art in Secondary Schools** (3) Staff
250 **Teaching Mathematics in Secondary Schools** (3) Pyke
251 **Second Language Instruction** (3) Chamot
A variety of methods for teaching a second language, both in the context of English as a Second Language and for foreign language instruction. (Fall)

254 **Issues, Studies, and Practices in English as a Second Language** (3) Staff
A critical review of scholarship and research findings in English as a second language. Major policy issues and implications that relate to ESL practice. (Summer)

255 **Educating Language Minorities** (3) Staff
A study of federal, state, and local policies and issues affecting the education of linguistically diverse populations. Resources for use with specific linguistically diverse groups. (Spring)

256 **Linguistic Applications in English as a Second Language** (3) Staff
A study of the science of language (phonology, morphology, syntax, semantics) and how its different branches (descriptive, social, applied, etc.) may be used for ESL teacher training, classroom instruction, material development, evaluation, research, and policy development. (Fall and summer)

257 **Second Language Acquisition** (3) Chamot
Nature of first and second language acquisition and development; emphasis on sociolinguistics and psycholinguistics most pertinent to educational settings. (Fall and summer)

258 **The Immigrant Experience: Diversity, Advocacy, and Education** (3) Mazur
The course provides participants with a variety of integrative and supportive multicultural activities, demonstrations, discussions, and projects. Participants will gain a knowledge base of immigrant stories, issues of discrimination, issues of cultural variation, and factors that affect diverse groups of students. Same as SpEd 258. Material fee, $25. (Summer)

272 **Strategies for Inclusion: Addressing Needs of Special Populations** (3) Mazur
Same as SpEd 272.

275 **The Culturally and Linguistically Diverse Student with Special Needs: Policy, Research, and Trends** (3) Mazur
Same as SpEd 275

276 **Academic and Psychosocial Assessment of the Culturally and Linguistically Diverse Student** (3) Mazur
Same as SpEd 276.

287–88 **Clinical Study and Treatment of Reading Problems** (3–3) Comas
A case study approach is employed to develop participants' competence to assess and tutor children, adolescents, and adults of diverse backgrounds, presenting a variety of reading and writing difficulties. Prerequisite: TrEd 222 and 224. Material fee, $25. (Academic year)

289 **Organization and Administration of Reading Programs** (3) Staff
For school administrators and reading teachers. Issues in planning, organizing, and monitoring the total reading program. (Spring)

290 **Severe Learning Disabilities in Reading** (3) Staff
The course links the fields of learning disabilities and reading, focusing on their interconnections in terms of etiology, characteristics, diagnosis, and remediation. (Fall)

291 **Reading and Writing Across the Curriculum** (3) Comas
A framework is presented for establishing a whole-language approach. Participants explore principles and strategies for developing students' reading and writing skills in art, literature, social studies, mathematics, and science. (Fall, spring, and summer)

292 **Internship: Reading** (3 to 6) Staff
Limited to graduate students in reading education. Experience in a selected area of teaching or supervisory service in field-based programs. Prerequisite: permission of instructor. (Fall and spring)

297–98 **Research and Independent Study** (1 to 3) Staff
Individual research under the guidance of a staff member; program and conferences arranged with an instructor.

308 **Instructional Processes in Teacher Preparation and Special Education** (3) Kochhar
Same as SpEd 308.

309 **Supervising the Preservice Clinical Experience** (3) Tate
An investigation of the complex process of clinical supervision as it relates to the professional growth and development of the practitioners at the preservice level, with a focus on both the interpersonal/social dimension and the process of instructional supervision. (Fall)

325 **Curriculum Theory** (3) Paley
Examination of reviews and research studies on curriculum theory. Focus on trends, values, interpretations, design systems, and evaluation. Prerequisite: TrEd 205.

330 **Paradigms of Instruction and Assessment** (3) Green
A foundation of theory, models, and variables that have contributed to the fields of instruction and assessment. The major paradigms of instruction and assessment. Material fee, $25. (Spring)

331 **Seminar in Instruction** (3) Pyke, Green
Analysis of alternative models of instruction and the factors that influence the instructional process in schools. Connections among instructional theory, research, and practice. Material fee, $25. (Fall)

332 **Search of the Literature in Curriculum and Instruction** (3) Chamot, Lynch
Analysis of types of literature reviews in the field of curriculum and instruction and development of a literature review; the relationship of theory building to review of literature, and how research questions arise from extant theory and related literature. For doctoral students in curriculum and instruction, to precede TrEd 390. Material fee, $25. (Spring)

333 **School Reform through Professional Development** (3) Staff
Fundamental perspectives of school reform through professional development of educators (K–12); evolution of contemporary professional development models and trends: examination of interactive modules using selected professional development activities. Material fee, $25. (Spring)

345 **Consultation Skills in Teacher Preparation and Special Education** (3) West
Same as SpEd 345.

353 **Post-Master's Internship in Teacher Education** (3 to 6) Staff
Same as SpEd 353.

354 **Doctoral Internship: Teacher Education** (3 to 6) Staff
Same as SpEd 354.

370 **Attitude Change and the Access Process** (3) Castleberry
Same as SpEd 370.

378 **Post-Master's Internship in Curriculum and Instruction** (3 to 6) Staff
Supervised fieldwork for selected experienced teachers. (Fall and spring)

390 **Doctoral Seminar in Curriculum and Instruction** (3 to 6) Shotel
Review of literature in a topical area; preparation of a dissertation proposal and a manuscript of publishable quality. Admission by permission of instructor and approval of major advisor. Material fee, $25. (Fall)

391 **Dissertation Research** (3 or 6) Staff
Prerequisite: TrEd 390.

SPECIAL EDUCATION

201 **Overview of Special Education** (3) Staff
Survey course to acquaint prospective teachers with special education and to help them become aware of the various educational modifications necessary to accommodate children with special needs in a school program. (Fall, spring, and summer)

220 **Selected Topics** (arr.) Staff
Topics and fees announced in the *Schedule of Classes*.

221 **Accessing Community Systems for Individuals with Disabilities** (3) Freund
Overview of access to community systems and service delivery for individuals with special needs and their families. Material fee, $25. (Summer)

222 **Legal Issues and Public Policy for Individuals With Disabilities** (3) Kochhar, Leconte
Examination, interpretation, and analysis of legislation and policies affecting the education and career development of individuals with disabilities. Emphasis on federal and state legislation in the context of national policy reform in disability services. Material fee, $25. (Fall)

223 **Introduction to Brain Injury: Programs, Policies, and Resources** (3) Ruoff and Staff
An overview of acquired brain injury and its effects; current trends in the field, related policy, research, and development of new resources. (Fall)

224 **Brain Function and Impact of Brain Injury on Learning and Education** (3) Ruoff and Staff
Provides an in-depth understanding of neuroanatomy related to the impact of brain injury on child and adolescent development and learning to prepare educators to participate in educational assessment and planning. (Spring)

225 **Family Partnership for Systems Change** (3) Ruoff, Kochhar
Applies a family systems perspective to prepare educators to establish and maintain partnerships with families of individuals with disabilities to improve educational services and access. Family roles in individualized education planning and service system coordination are addressed. (Spring and summer)

226 **Vocational–Technical Education for Special Populations** (3) West
Preparation for leadership roles as vocational and technical education and transition personnel; overview of delivery models emphasizing special education. (Spring)

227 **Technology in Vocational Evaluation** (3) Leconte and Staff
Introduction to an array of assistive technology services and products facilitating professional interventions and vocational evaluation procedures; application to the assessment of persons with disabilities. Material fee, $30. (Fall)

228 **Community-Based Assessment and Work Sample Development** (3) Leconte and Staff
Introduction to community-based vocational appraisal methods; development of job training analysis skills, labor market surveys, work samples; requirements of The Americans with Disabilities Act; incorporation of assistive technology; classroom theory and field work. Material fee, $25.

229 **Interpretation and Application of Academic and Vocational Assessment Information** (3) Leconte
Specific strategies and techniques to analyze, interpret, and synthesize assessment information for the development of comprehensive academic/vocational profiles for adolescents and adults with disabilities. Observation and recording procedures, report development, and postassessment conferencing are emphasized. Material fee, $25. (Summer)

230 **Vocational Assessment of Individuals with Disabilities** (3 to 6) Leconte
Investigation of vocational appraisal processes and techniques for individuals with disabilities. Includes assessment for transition using field-based assignments. Three credits of practicum experience for students specializing in vocational evaluation. Material fee, $25. (Fall, spring, and summer)

231 **Instructional Methods in Special Education and Transition** (3) Taymans, West
Techniques and processes used in programming for the needs of individuals with disabilities as they prepare for transition to postsecondary programs and employment. Emphasis on skills related to professional liaison and support roles in the design of instructional arrangements and cooperative training. Material fee, $20 (Fall and spring)

232 **Foundations in Special Education, Career Development, and Transition** (3) Kochhar
Overview of historical, theoretical, and philosophical foundations of career development and transition. Explores directions for career development/transition practices in the context of educational reform and social and political change. Material fee, $25. (Fall)

233 **Curriculum in Transition Special Education** (3) Taymans, West
Theory and practice in planning, implementing, and evaluating curriculum for individuals with disabilities. Emphasis on techniques for modifying curriculum and materials for individualized programming. Requires field-site curriculum implementation. Material fee, $25. (Fall and spring)

234 **Seminar in Professional Development in Special Education and Transition** (3 to 6) Kochhar
Analysis and development of advanced professional writing skills, including literature synthesis, persuasive writing, and proposal writing. Material fee, $20. (Fall)

235 **Employment Models for Individuals with Disabilities** (3) Staff
Rationale, resources, and programming strategies for the development and coordination of employment programs for individuals with disabilities. Material fee, $25.

236 **Introduction to Career, Vocational, and Transition Services** (3 to 6) West and Staff
Introduction to programs that provide career, vocational, and transition services to individuals with disabilities. Material fee, $25. (Summer)

237 **Learning Strategies, Assessment, and Instruction for Individuals with Learning Disabilities** (3 to 6) Taymans
Theory and practice in evidence-based reading interventions. Learning strategies; content enhancement focused on literacy and self-determination. Material fee, $25. (Spring and summer)

238 **Issues in Educating Individuals with Learning Disabilities** (3) Taymans
Introduction to the academic, cognitive, social, and emotional characteristics of individuals with learning disabilities; etiological theories; educational service delivery models, with particular emphasis on the adolescent with learning disabilities. Policy issues, continuum of services, and the transition from school to post-school environments. Material fee, $25. (Fall and spring)

239 **Collaboration for Professionals Working with Students with Special Needs** (3) Taymans and Staff
Exploration of attitudes and beliefs about team teaching, collaboration and inclusionary environments. Development of knowledge and skills related to collaborative consultation and team teaching; interpersonal communication; the dynamics of collaborative teams; examination of the variety of environments in which special educators work. Material fee, $25. (Fall and spring)

240 **Family Support and Guidance in Special Education** (3) Jarrett
The developmental process of parenting and how that process is affected by having a child with developmental delay or disability. Family systems theory, stress and coping mechanisms, and communication and support strategies. Material fee, $25. (Fall and summer)

241 **Dynamics of Family Intervention: Theory and Practice in Special Education** (3) Rice
Theoretical foundations and clinical techniques necessary for the special educator to collaborate with parents of adolescents with emotional and behavioral disabilities. Material fee, $25. (Fall and spring)

242 **Neurodevelopmental Assessment and Programming for Infants and Toddlers with Disabilities** (3) Jarrett
Provides students with a theoretical background and practical experience to translate the neurodevelopmental model into techniques for developing and implementing educational programs for infants and toddlers with disabilities. Prerequisite or concurrent registration: SpEd 263 or 268 or permission of instructor. Material fee, $30. (Fall)

243 **Developmental Assessment of Infants** (3) Jarrett
Theory and current practice in the assessment of infants with or at risk for developmental disabilities. Material fee, $30. (Spring)

244 **Ethical Considerations in Neonatal and Infant Intervention** (3) Freund
Overview of the major ethical issues involved in neonatal and infant intervention. The impact of recent and emerging technological innovations considered from medical, legal, ethical, and psychosocial perspectives. Material fee, $25. (Spring and summer)

253 **Special Education in Correctional and Alternative Settings** (3) Staff
An introduction to the delivery of special education services within a range of alternative settings and the juvenile justice and corrections systems. Material fee, $25. (Spring)

254 **Special Education in Correctional and Alternative Settings: Field Experiences** (3) Staff
Site visits to local, state, and federal juvenile correction facilities and advocacy organizations, with seminar series to integrate theory and practice. Material fee, $20. (Summer)

255 **Interdisciplinary and Interagency Services Coordination for Special Populations** (3) Mazur, Kochhar, and Staff
Overview of models and strategies for coordinating services across disciplines and among school and community agencies for special populations. Emphasis on interdisciplinary team coordination, communication, decision making, planning, and follow-up for individuals with disabilities. Material fee, $25. (Fall, spring, and summer)

258 **The Immigrant Experience: Diversity, Advocacy, and Education** (3) Mazur
Same as TrEd 258.

260 **Developmental Assessment in Special Education** (3) Castleberry
Examination of formal psychoeducational tests used with preschool and elementary-school-aged children. Development of formal and informal assessment

techniques. Introduction to the skills necessary to write psychoeducational reports. Material fee, $40. (Fall, spring, and summer)

261 **Practicum: Methods and Materials for Young Children with Disabilities** (3 or 6) Jarrett, Castleberry
Clinical practice in design and implementation of educational strategies and materials, including designing and developing teaching materials, classroom teaching, feedback and evaluation with professor. A seminar accompanies this clinical experience. (Fall, spring, and summer)

262 **Formal Assessment of Young Children with Disabilities** (3) Castleberry
Weekly seminar designed to prepare early childhood special educators to translate formal assessment data into instructional programming. Requires fieldwork with children. Material fee, $40. Prerequisite: SpEd 260 or equivalent. (Spring)

263 **Development of the Infant with Special Needs** (3) Jarrett
The processes of normal infant development and interrelationships among areas of development; relationship of these processes to the growth and development of infants with or at risk for developmental disabilities. Material fee, $25. (Fall)

266 **The Development of Language and Literacy** (3) Jarrett, Mazur
Typical and atypical language acquisition and literacy development. Assessment and intervention strategies for parents and professionals. Material fee, $10. (Fall, spring, and summer)

267 **Instructional and Assistive Technology in Early Childhood Special Education** (2 or 3) Jarrett
Instructional and assistive technology and its implications and uses for young children (0–5 yrs) in a wide variety of environments. Lectures, laboratory, and demonstrations. Material fee, $25. (Summer)

268 **Development of Young Children with Disabilities** (3) Castleberry, Mazur
Theories of human growth and development are considered as a framework for examination of typical and atypical development of young children. Material fee, $25. (Fall, spring, and summer)

269 **Etiology, Symptomatology, and Approaches to Intervention with Children with Disabilities** (3) Castleberry
An in-depth examination of the causes and characteristics of various disabilities. Current principles and approaches to intervention are examined. Material fee, $25. (Spring)

270 **Adapting Attitudes, Programs, and Curriculum for Students with Disabilities in the Mainstream Environment** (3) Staff
Meeting the needs of the special-needs student in the regular classroom. Material fee, $20. (Spring and summer)

271 **Interdisciplinary Approach to Planning for Children with Disabilities** (3) Rice
Interdisciplinary team functioning and service coordination using a systems approach. Organizational development theories, attributes of effective teams, communication, negotiation strategies, and service coordination.

272 **Strategies for Inclusion: Addressing Needs of Special Populations** (3) Mazur
Strategies by which second language learners, students with disabilities, and students with disabilities who are also second language learners can be in an inclusionary setting so that all teachers can more effectively assume the responsibility to serve all children in our schools. Material fee, $25. (Fall, spring, and summer)

273 **Impact of Culture on Education** (3) Mazur
The impact of culture and ethnicity on educational experiences. The relationship between school culture in the United States, one's own culture(s), and the cultures of diverse populations existing within our schools. Values, norms, rules, ethics, beliefs, attitudes, expectations, and assumptions of various cultures. Material fee, $25. (Fall, spring, and summer)

275 **The Culturally and Linguistically Diverse Student with Disabilities: Policy, Research, and Trends** (3) Mazur
Educational service delivery for the culturally and linguistically diverse student. National, state, and local policies; current research in bilingual education, special education, and bilingual special education. Assessment techniques, accessing resources, and characteristics and needs of language-minority students and their families. Same as TrEd 275. Material fee, $25.

276 **Academic and Psychosocial Assessment of the Culturally and Linguistically Diverse Student** (3) Mazur
Issues and implications of second-language learning; the relationship between learning disabilities and problems related to adaptation to a different culture. Students review and evaluate formal and nonformal assessment measures and administer bilingual assessment materials. Same as TrEd 276. Material fee, $25.

277 **Teaching the Culturally and Linguistically Diverse Student with Disabilities: Methods, Materials, and Classroom Management** (3) Mazur
Commonly used tests, formal and informal assessment strategies and prereferral interventions, and curricular and classroom management strategies for use with bilingual students who have special needs. Instructional adaptations designed to meet cultural, linguistic, and academic needs in both mainstream and special classes. Material fee, $25.

278 **Internship: Educational Intervention for the Culturally and Linguistically Diverse Student with Disabilities** (3 to 6) Mazur
Supervised internship. Students learn to write culturally relevant IEP programs, conduct effective parent interviews, and relate assessment findings to productive programming. Material fee, $15 per credit hour.

279 **Dynamics of Interaction: The Essence of Relationships Between Teachers and Students** (3) Rice
An examination of philosophical and psychological theory germane to understanding the nature of human interaction between teachers and students. Material fee, $25. (Fall)

280 **Developmental Assessment of Adolescents** (3) Staff
Formal and informal psychoeducational assessment; assessment instruments commonly used with upper-elementary, junior, and senior high school students; the writing of psychoeducational reports. Material fee, $35. (Spring)

281 **Internship in Teaching Children with Emotional and Behavioral Disabilities: Assistant Teacher** (3 to 6) Rice
A full-time teaching experience with children with emotional and behavioral disabilities. Graduate students assist in implementing psychoeducational assessment and teaching practices. Daily guidance by on-site training teachers and weekly supervision by University clinical faculty. Weekly seminar accompanies this internship. Material fee, $45. (Fall)

282 **Internship in Teaching Children with Emotional and Behavioral Disabilities: Co-Teacher** (3 to 6) Rice
Continuation of SpEd 281. Graduate students become the primary teaching team in the classroom with ongoing supervision. Graduate students plan and apply psychoeducational teaching strategies with children with emotional and behavioral disabilities. Refinement of instructional and behavior management strategies through the full-time teaching experience. Weekly seminar continues. Material fee, $45. (Spring)

283 **The Urban Setting and Its Impact upon Children with Emotional and Behavioral Disabilities** (3) Staff
The cultural differences and ethnic complexities that face minority children in urban schools. Effects of the total environment in which inner-city children live on their ability to learn, feel, and behave. Material fee, $25. (Fall)

284 **Preparation for Internship in Teaching Adolescents with Emotional and Behavioral Disabilities** (3) Staff
Review and refine program theory and skills of the psychoeducational theory prior to internship. Material fee, $10. (Spring)

285 **Teacher as Consultant: Inclusion of Adolescents with Emotional and Behavioral Disabilities** (3) Rice
Skills and insights pertaining to the consultation process between special education and regular classroom professionals. Consultant process viewed in an ecological systems orientation. Material fee, $35. (Spring)

288 **Characteristics of Emotional and Behavioral Disabilities** (3) Rice
An in-depth examination of typical and atypical growth and development, psychiatric diagnosis and psychosocial development issues, and general and specific characteristics of the student with serious emotional disturbance. May be repeated for credit. Material fee, $30. (Fall and spring)

289 **Curriculum and Instructional Strategies for Adolescents with Emotional and Behavioral Disabilities** (3 to 6) Rice
Design, adaptation, and implementation of instructional methods and materials. Material fee, $25. (Fall)

290 **Affective Development and Behavior Management in Special Education** (3) Castleberry, Jarrett
Theory, programming, and behavior management strategies from theoretical and practical points of view. Material fee, $25. (Spring)

291 **Behavior Management Practicum: Adolescents with Emotional and Behavioral Disabilities** (3) Rice
Field-based examination of theory of behavior development and techniques for classroom management. Material fee, $25. (Summer)

292 **Internship: Teaching Young Children with Disabilities** (3 or 6) Castleberry
Supervised internship in early childhood special education. Weekly seminar. Material fee, $15 per credit hour. (Spring and summer)

293 **Internship: Early Intervention** (3 to 6) Jarrett, Browne
Supervised internship in early intervention. Weekly seminar. Material fee, $15 per credit hour. (Fall, spring, and summer)

294 **Internship: Teaching Adolescents with Emotional and Behavioral Disabilities** (6 to 9) Rice
Full-time placement as a psychoeducator in various roles and sites. Material fee, $90. (Fall, spring, and summer)

295 **School- and Community-Based Internship in Special Education and Transition** (1 to 9) Leconte, Taymans
A 50- to 450-hour supervised internship in school- and community-based settings involved in career, vocational, and transition services. (Fall, spring, and summer)

296 **Teaching Internship in Transition Special Education** (3 to 6) Kochhar, West, Taymans
Supervised teaching internship; seminar required. Permission by instructor. Material fee, $15 per credit hour. (Fall, spring, and summer)

297–98 **Research and Independent Study** (1 to 3) Shotel
Individual study or research under guidance of staff member. Admission by permission of advisor. May be repeated for credit.

301 **Research Seminar in Special Education** (arr.) Kochhar
Participation in a small group with a selected faculty member; research on and discussion of an area of common interest. Admission by permission of instructor. (Summer)

303 **Administration and Supervision of Special Education** (3) West and Staff
Philosophy and nature of special education; program organization, administration, and development. Surveying local needs; program evaluation and supervision. Admission by permission of instructor. Material fee, $25. (Spring)

304 **Recent Research and Trends in Special Education** (3) Taymans, Kochhar
Emphasis on topical research issues, problems of conducting research, and procedures and sources for obtaining research funding. Material fee, $25. (Fall and spring)

308 **Instructional Processes in Teacher Preparation and Special Education** (3) Kochhar
Philosophical and methodological aspects of personnel preparation in university and field-based programs; opportunities for practice in needs assessment, program design, and instruction. Admission by permission of instructor. Same as TrEd 308. Material fee, $20. (Spring)

309 **Supervising the Preservice Clinical Experience** (3) Tate, Hall
An investigation of the complex process of clinical supervision as it relates to the professional growth and development of practitioners at the preservice level. Focus on interpersonal/social dimensions and the process of instructional supervision. (Fall)

343 **Psychoeducational Diagnosis in Special Education** (3) Staff
The range of diagnostic and intervention strategies applicable to the student who presents psychosocial and related learning difficulties. Admission by permission of instructor. Material fee, $25. (Spring)

345 **Consultation Skills in Teacher Preparation and Special Education** (3) West
Consultation models from organizational development, organizational psychology, and mental health applied to professional practice in education and special education. Material fee, $25. (Spring)

352 **Seminar: Legal Issues and Public Policy Concerns for Individuals with Disabilities** (3) Kochhar
Overview of current legislation and public policy affecting education, employment, and civil rights of individuals with disabilities. The evolution of disability policies and their relationship to principles of social justice. Material fee, $25. (Fall)

353 **Post-Master's Internship in Special Education** (3 to 6) Jarrett, Freund, Mazur, Kochhar, Shotel, Taymans, West
Supervised professional internship in college teaching, administration, supervision, research, or policymaking. Internships are individually arranged. Admission by permission of instructor. (Fall, spring, and summer)

354 **Doctoral Internship: Special Education** (3 to 6) Jarrett, Freund, Kochhar, Mazur, Shotel, Taymans, West
Supervised professional internship in college teaching, administration, supervision, research, policymaking, or private agency function. Each internship is individually arranged. Admission by permission of advisor. (Fall, spring, and summer)

360 **Interdisciplinary Techniques in the Diagnostic Process in Special Education** (3) Staff
Application of theoretical concepts of assessment; development of assessment programs; interpretation and application of interdisciplinary diagnostic evaluations. Prerequisite: SpEd 260 or equivalent, and permission of instructor. Material fee, $25. (Fall)

370 **Attitude Change and the Access Process** (3) Castleberry
Consideration of psychosocial constructs germane to the role of the consultant/administrator in educational and interdisciplinary settings. Application of theory in accessing human service delivery systems. Material fee, $25. (Fall)

390 **Doctoral Seminar in Special Education** (3 to 6) Shotel
Review of literature in a topical area; preparation of a dissertation proposal and a manuscript of publishable quality. Admission by permission of instructor and approval of major advisor. Material fee, $25. (Fall)

391 **Dissertation Research** (3 or 6)
Prerequisite: SpEd 390.

THEATRE AND DANCE

Professors M.R. Withers, A.G. Wade, L.B. Jacobson (*Chair*), N.C. Garner
Associate Professors W.A. Pucilowsky, C.F. Gudenius, E.J. O'Brien
Assistant Professors B.W. Sabelli, M.A. Buckley, F. Minwalla, D. Burgess

Master of Fine Arts in the field of classical acting—Columbian College of Arts and Sciences, in cooperation with the Shakespeare Theatre Academy for Classical Acting, offers the Master of Fine Arts in the field of classical acting. The program is an intensive endeavor intended for students who have had extensive theatre training as part of their undergraduate preparation or have spent several years after completing college as working professionals in the field.

Required: The general requirements stated under Columbian College of Arts and Sciences. The 59-credit-hour degree program is taken in three intensive sessions over an 11-month period.

Master of Fine Arts in the field of theatre with a concentration in theatre design—Prerequisite: the degree of Bachelor of Arts from this University, or an equivalent degree.

Required: the general requirements stated under Columbian College of Arts and Sciences. The program of study consists of 54 credit hours of 100- and 200-level course work in theatre and dance and in art, planned in consultation with the advisor, including a creative thesis (TrDa 299–300). The program may emphasize scenery, lighting, or costume. For listings of 100-level courses, see the Undergraduate Programs Bulletin.

Departmental prerequisite: Prerequisite to TrDa 201 through 229: degree candidacy in the M.F.A. in the field of classical acting. Prerequisite to all other 200-level courses: M.F.A. candidacy or permission of instructor.

201–4 **Acting** (2 or 3 each)
The focus of the acting sequence shifts with each session, providing a studio structure to explore and meet the demands of the classical canon. Portions of

the sequence focus on the history plays and tragedies, classic comedy, high comedy, the Jacobeans, and master classes.

205–8 **Topics in Classical Drama and Culture** (1 or 2 each)
Plays and other writings from the Elizabethan, Jacobean, and Restoration eras and the 18th century. The historical world in which the plays were written as well as the imaginary worlds created in the plays themselves.

209–10 **Text** (2–2)
Textual analysis emphasizing development of aesthetic expression. The forms and rules of verse: its meter, scansion, and overall structure in the early, middle, and late Shakespeare plays, as well as the intricacies of the prose.

211–14 **Voice and Speech** (2 or 3 each)
The development of clear, supported speech and sound that can meet the demands and challenges of classical texts. Resonators, articulators, breathing, and placement; phonetics and ear training; defining the character through the voice.

215–18 **Movement** (1 or 2 each)
The development of an awareness of the body and its expressive abilities through an integrated approach that includes ballet, modern dance, Hatha Yoga, and Feldenkrais for coordination, focus, and expression.

219–22 **Alexander Technique** (1 or 2 each)
Through group work and individual sessions, students develop a further awareness of the body toward expression of imagination and the creative process, enabling powerful characterization without stress or personal physical distortion.

223–24 **Stage Combat** (2–2)
Skills in stage combat techniques, including unarmed combat and broadsword, buckler, rapier, dagger, and other lighter weapons, toward development of greater physical strength and an awareness of safety issues. The course is designed to lead to certification as an actor/combatant through the Society of American Fight Directors.

225–28 **Practicum** (arr.)
This sequence of courses includes scene preparation, rehearsal/production, clown class, and other performance skills.

229 **Audition Techniques** (3)
A set of workshops to help students develop strong audition skills. Business aspects of acting, such as selection of agents, Equity status, and taxation issues. The workshop concludes with a showcase performance for casting directors, agents, and theatre directors.

231 **Lighting Design** (3) Gudenius
Theory and execution of lighting design for theatre and dance. Prerequisite: TrDa 131. May be repeated for credit. (Spring)

233 **Architecture of Theatre and Exhibit Spaces** (3) Sabelli
Theatrical architecture from a historical perspective. Traditional and nontraditional exhibit, theatrical, and assembly spaces are examined and evaluated with reference to the functional use of space from practical, architectural, and aesthetic perspectives. Studio work includes design of a hypothetical performance space and its auxiliary units.

234 **Scene Design: Renderings** (3) Sabelli
Preparation for the advanced student designer, with emphasis on the individual development of rendering techniques including computer graphics, practical design applications, traditional script analysis, and original scenographic interpretations. May be repeated once for credit. (Fall, even years)

235 **Scene Design: Model Making** (3) Sabelli
Exploration of all styles of traditional and contemporary scenography through the making of scale models. May be repeated once for credit. Admission by permission of instructor.

236 **Intermediate Costume** (3) Pucilowsky
Introduction to the basic techniques of costume design through specific projects. Various rendering techniques will be explored, consistent with the historical period concerned. May be repeated for credit. Prerequisite: TrDa 136. (Spring, odd years)

237 **Advanced Costume** (3) Pucilowsky
Study of special design, style, and construction problems. May be repeated for credit. (Fall and spring)

238 **Pattern Making** (3) Pucilowsky
The study of pattern drafting and draping methods, based on contemporary and historical clothing, through lecture and class work. Prerequisite: TrDa 136. (Spring, even years)

241 **Production Drafting** (3) Gudenius
Development of drafting skills for production: groundplans, elevations, sections, perspectives, etc.

246 **Scene Painting** (3) Gudenius
Development of the skills of painting needed for the reproductive craft of theatrical painting.

291 **Internship** (3 or 6) Staff
Internships with theatre companies or arts organizations, including conference and/or seminar. May be taken for a total of 6 credit hours.

292 **Selected Topics** (1 to 3) Staff
May be repeated for credit.

294 **Independent Research** (arr.) Staff
May be repeated for credit.

299–300 **Thesis Research** (3–3) Staff

TOURISM AND HOSPITALITY MANAGEMENT

Professors D.E. Hawkins, D. Frechtling
Associate Professors L. Yu (*Chair*), L.A. Delpy Neirotti, S. Spivack, M.V. Smith
Assistant Professors T.W. Hilliard, R. Brouard
Assistant Professorial Lecturer E. Zavian
Professorial Lecturer W.C. Corkern
Lecturer H.E. Reichbart

See the School of Business for programs of study leading to the Master of Tourism Administration and Master of Business Administration. A graduate certificate in aviation management is also offered. For information on the five-year, joint-degree program leading to the Bachelor of Business Administration and Master of Tourism Administration, see the Undergraduate Programs Bulletin.

220 **International Hotel Management** (3) Yu
The study of multinational hospitality operations, with emphasis on U.S. corporate involvement in and planning for overseas expansions. Political, economic, cultural, financial, and legal aspects inherent in the international business environment. (Fall)

230 **Organization and Management of Airlines** (3) Staff
Overview of domestic and international passenger air transportation systems. Analysis of planning, financing, operating, marketing, and evaluating airline transportation systems. Legal and regulatory aspects of airline operations. Development of infrastructure and related support services.

249 **Economic, Cultural, and Environmental Aspects of Tourism** (2) Spivack
Relationship of tourism and sustainable development; specific emphasis on cultural, environmental, and economic impacts and trends. (Fall)

250 **Administration of Tourism and Hospitality Services** (2) Frechtling
Organization and management concepts, theory, and issues, stressing application of theory through analysis of case examples drawn from the tourism and hospitality industry. Prerequisite TStd 104 or equivalent. (Fall)

251 **Statistical Applications in Tourism/Hospitality Management** (2) Yu
Application of quantitative methods in tourism and hospitality management research. Procedures and methodology for collecting data, summarizing and interpreting data, and drawing conclusions based on the data. (Fall)

260 **Tourism Development** (3) Frechtling
Tourism development approaches, contexts, and consequences for local/regional destinations; application of financial management concepts to the feasibility study of a proposed tourism-related facility; and evaluation of the sustainability of a tourism development strategy. (Spring)

261 **Tourism Planning** (3) Staff
Integrated planning for tourism organizations; development of comprehensive tourism projects; consideration of basic concepts, approaches, and models. (Spring)

262 **Tourism Policy Analysis** (3) Staff
Components of tourism policy, including development of tools for tourism policy analysis and description of tourism organizations in the government and private sector. (Spring)

263 **Tourism Marketing** (3) Frechtling
Concepts and techniques employed in marketing tourism industry services and development of the annual marketing plan. (Fall)

264 **Sport Marketing** (3) Delpy Neirotti
Application of marketing theories to sport and events. Case examples of marketing athletes, teams, facilities, sport products and organizations, as well as using sport or events as a marketing tool for products. Writing sponsorship and endorsement proposals and incorporating sport into an integrated marketing plan. Prerequisite: MBAd 230 or equivalent. (Fall)

265 **Sport Law: Contracts and Negotiations** (3) Zavian
Examination of legislation and specific case law as related to professional and amateur athletes, sport events, licensed merchandise, broadcast and sponsorship rights. Topics include labor and anti-trust law; contract negotiation, specifications, and interpretation. (Spring)

266 **Sport and Event Facility Management** (3) Delpy Neirotti
Financing, market analysis, design, operations, and marketing of sport and event facilities from stadiums and arenas to amphitheaters and convention centers. (Spring)

267 **Sport Media and Communications** (3) Staff
Concepts and practices of sport public relations, media relations and management, the Internet, and other media utilized in sports. Press releases, publications, crisis management, and press operations. (Summer)

270 **Tourism Research** (2) Frechtling
Survey research and other research methods and their applications to tourism, hospitality, sport, event, or related management. (Spring)

277 **Event Management** (3) Hilliard
An introduction to the theoretical and practical foundations of event management. Fundamentals of planning, budgeting, and evaluating events. Prerequisite: M.T.A. candidacy or permission of instructor. (Fall)

278 **Conference and Exposition Management** (3) Hilliard
Site selection, program planning and management, exhibits, selection and use of facility, volunteers, and budget management. (Spring)

279 **Event Entertainment Management** (3) Staff
Event entertainment, including designing and planning the entertainment component of an event, as well as managing and marketing entertainers in an event context. (Summer)

280 **Advanced Workshop** (1 to 6) Staff
Workshops with emphasis on contemporary issues and opportunities; development of advanced professional competencies. May be repeated for credit with permission of advisor. (Fall, spring, and summer)

282 **International Experience** (1 to 6) Staff
Travel to a foreign country for study of specific topics. May be repeated for credit with approval of advisor. (Fall, spring, and summer)

283 **Practicum** (3) Staff
For graduate students enrolled in a degree program or field offered through the department. Fieldwork, internship, and/or instructional practice, including conference and/or seminar. May be repeated once for credit with permission of advisor. (Fall, spring, and summer)

290 **Special Topics** (1 to 3) Staff
Experimental offering; new course topics and teaching methods. May be repeated once for credit.

296 **Travel Information Management Systems** (3) Spivack
Database utilization, information analysis, reservation systems, computer applications including the Internet, and related travel management systems. (Fall, spring, and summer)

297 **Advanced Topical Studies** (3) Hawkins
Required capstone experience for tourism administration students who do not select the thesis option. Analysis of case situations involving policy formulation

or management decision making; emphasis on applied strategic planning and management approaches.

298 **Directed Reading and Research** (1 to 3) Staff
Supervised readings or research. Admission by prior permission of instructor. May be repeated for credit.

299 **Thesis Seminar** (3) Staff

300 **Thesis Research** (3) Staff

UNIVERSITY PROFESSORS

University Professors A. Etzioni, P.J. Caws, S.H. Nasr, K.F. Schaffner, J.N. Rosenau

Courses numbered in the 770s and 780s are taught by distinguished scholars who hold appointments as University Professors. With the approval of the department or program concerned, appropriate University Professor courses may be taken to satisfy degree program requirements. Permission of the University Professor may be required for enrollment. A complete listing of courses offered each semester appears in the *Schedule of Classes* under the 700 series. Following is a list of courses that are expected to be taught fairly regularly by University Professors.

IAff/PSc

770 **Turbulence in World Politics** (3) Rosenau
An effort to probe the sources and dynamics of change and continuity in local, national, and international affairs. The links between the orientations of individuals and the actions of collectivities are a major focus, along with the foundations of authority under transformative conditions. For graduate students; open to upper-level undergraduates.

IAff/PSc

771 **Political Aggregation** (3) Rosenau
An exploration of how collective action is fashioned out of the input of individuals, how collectivities become larger than the sum of their parts, and how political organizations manage to persist through time. Socialization, mobilization, momentum, and bandwagon effects are among the concepts evaluated. For graduate students; open to upper-level undergraduates.

IAff/PSc

772 **The Dynamics of Globalization** (3) Rosenau
An inquiry into the economic, cultural, and political processes through which individual and community life is expanding as awareness encompasses factors on a global scale. The consequences of this expansion at both global and local levels is examined, along with the possibility that these levels interact. For graduate students; open to upper-level undergraduates.

IAff/PSc

773 **Global Governance** (3) Rosenau
An inquiry into the prospects for and problems of governance on a global scale in the era following the end of the Cold War. Informal forms of governance as well as those that have undergone institutionalization are assessed. For graduate students; open to upper-level undergraduates.

Phil

772 **Individualism** (3) Caws
The concept of the free individual in philosophy, psychology, literature, and politics: individuals and groups; individualism and collectivism; exemplary individuals in biography, autobiography, and fiction; problems of individual and collective agency and identity. For undergraduates; open to graduate students.

Phil

774 **Understanding Technology** (3) Caws
The idea of technology—its relation to the sciences and the arts and humanities, its development, and its problems. Technology will not be regarded as merely dependent on the sciences or as merely useful (or dangerous) but as a human activity in its own right, with its own history, conceptual structure, interests, risks, and benefits. For undergraduates; open to graduate students.

Phil
778 **Left and Right in Philosophy and Politics** (3) Caws
A fundamental inquiry into the concept of the state in terms of entrenched oppositions: individualism/collectivism, equality/liberty, liberalism/conservatism, socialism/free enterprise, communism/capitalism. Emphasis on the present need to find a constructive transcendence of these oppositions. For graduate students; open to undergraduates.

Phil
779 **Philosophy and Psychoanalysis** (3) Caws
An exploration of some striking parallels between the topics addressed by Freud's psychoanalytic theories on the one hand and the traditional content of philosophical reflection on the other, with special emphasis on the relation between cognitive theory and therapeutic practice (in both disciplines). For graduate students; open to undergraduates.

HCS/Phil
770 **Philosophy of Medicine** (3) Schaffner
An introduction to philosophical issues in medicine, including scientific progress, the doctor–patient relationship, whether diseases are objective or socially conditioned entities, clinical reasoning using some simple examples from medical diagnosis and new drug testing, and ethical and social issues raised by the AIDS epidemic. For undergraduates; open to graduate students.

Phil
771 **Philosophy of Biology** (3) Schaffner
An introduction to philosophical issues in biology, including evolutionary biology, molecular biology and reductionism, teleology, experimental objectivity, philosophical implications of the neurosciences, sociobiology, and evolutionary ethics. For undergraduates; open to graduate students.

HCS/Phil
775 **Ethics and Health Policy** (3) Schaffner
The problem of health care reform and ethical issues associated with managed care and competition, Medicare and Medicare reform, and the issue of health care rationing. Issues relating to the "right to die," including active and passive euthanasia and physician-assisted suicide. For graduate students; open to undergraduates.

HCS/Phil
777 **The Human Genome Project: Ethical, Legal, and Social Implications** (3) Schaffner
Ethical, legal, and social implications of the decoding of the entire human genome, including confidentiality of genetic information, genetic discrimination and insurance, reductionistic/deterministic implications, forensic issues, research ethics, gene therapy and patenting, and cloning. For graduate and medical students; open to undergraduates.

HCS/Phil
780 **Neurobiology and Reductionism** (3) Schaffner
Recent developments in neuroscience and theories of consciousness, including neural networks; philosophical implications, including the relations among genetics, brains, and behavior. For graduate students; open to qualified undergraduates.

Rel
770 **Islamic Civilization and the West** (3) Nasr
The encounter of Islam and the West, from the rise of Islam to modern times. Investigation of the impact of Islam on European philosophy, science, art, and literature; influence of the West and Western scholarship on the Islamic world. For juniors and seniors; open to graduate students.

Rel
771 **Persian Sufi Literature in East and West** (3) Nasr
The writings of major Persian Sufi poets and writers, such as Khayyam, Attar, Rumi, Shabistari, and Hafiz, and their impact on the West and on India. The

translation of these works into European languages and their influence upon such figures as Goethe and Emerson are discussed. Assigned readings in English. For undergraduates; open to graduate students.

Rel

772 **Mysticism—East and West** (3) Nasr
A thematic examination of mystical traditions: the nature of mysticism, the search for ultimate reality, the mystical significance of the cosmos, the mystical science of the soul, and the significance of sacred art and symbols. Major mystical traditions of East and West—Hinduism, Taoism, Buddhism, Judaism, Christianity, Islam. For undergraduates; open to graduate students.

Rel

773 **Perennial Philosophy** (3) Nasr
The idea of perennial philosophy as developed in the 20th century by A. Huxley, A.C. Coomaraswamy, and others. Doctrines and teachings of perennial philosophy as found in various religious and philosophical traditions of East and West. Prerequisite: at least one course in religion, philosophy, or intellectual history. For undergraduates; open to graduate students.

Rel

775 **Man and the Natural Environment** (3) Nasr
The religious, philosophical, and scientific causes of the present environmental crisis. The history of religious and philosophical attitudes toward nature in the West, in the history of Western science, and in some non-Western world views that may encourage a more harmonious relationship between man and the natural environment. For undergraduates; open to graduate students.

Rel

777 **Religion and Science** (3) Nasr
The interaction between religion and science in ancient Egypt, classical Greece, Islam, India, China, and the West, from the Renaissance, the scientific revolution, and up to the present day. Key concepts and issues in the encounter of religion and science in light of the cultural matrix of the civilization and period in question. For juniors and seniors; open to graduate students.

Soc

776 **Public Policy Research** (3) Etzioni
Basic concepts of policy research in comparison to basic and applied research. Policy research methods. The social structure of policy research: producers and consumers of knowledge and issues arising among them. Open to undergraduates and graduate students with permission of the instructor. Prerequisite: social science or public policy course work or related experience.

PSc/Soc

777 **Contemporary American Society** (3) Etzioni
A social science perspective of contemporary American society. Analysis of concepts that allow continued insight into America's condition and future. Institutions examined include the family, schools, communities, the polity, and relations among racial/ethnic groups. For graduate students; open to undergraduates.

Soc/Econ/PSc

779 **The Elements of Socioeconomics** (3) Etzioni
A synthesized approach to the study of economic behavior and economic policy, drawing on relevant segments of economics and sociology as well as political science and psychology. A discussion of ethical assumptions and core concepts in the study of micro- and macroeconomic behavior and their policy implications. For graduate students; open to qualified undergraduates.

Soc/PSc/IAff

781 **Elements of Communitarian Thinking** (3) Etzioni
An examination of the roots of communitarian thinking in earlier philosophical work, current political theory, and historical and contemporary sociology. The relevance of communitarian thinking to various community-building social

movements. For graduate students; open to undergraduates with permission of instructor.

Soc/PSc/IAff

782 **Elements of Public Policy in Communitarian Perspective** (3) Etzioni
The issues that arise when communities seeking to advance their goals run into commitments to individual and minority rights. Freedom of speech and hate codes, public safety and protection against search and seizure, majority votes and minority rights, and other policy issues. For graduate students; open to undergraduates with permission of instructor.

Soc

785 **The U.S. System of Criminal Justice** (3) Saltzburg
For undergraduates with an interest in law, social justice, and the politics of crime prevention. A rule-oriented view of the adversarial process and key players in the U.S. criminal justice system, including police authority and its limits, the privilege against self-incrimination, and roles of the judge and jury.

VIRGINIA CAMPUS

With an emphasis on graduate education and research, The George Washington University offers academic programs on its Virginia Campus. The School of Engineering and Applied Science, School of Business, and Graduate School of Education and Human Development offer graduate study leading to master's and doctoral degrees at this site. The Virginia Campus offers extensive library and research facilities networked by computer to information databases nationwide.

Through the School of Business and the Graduate School of Education and Human Development, the executive programs outlined below are offered on the Virginia Campus. In addition, the School of Engineering and Applied Science offers course work leading to master's and doctoral degrees in several fields, including an accelerated weekend program leading to the Master of Science in the field of telecommunications and computers.

Academic programs on the Virginia Campus are extensive and growing. Please note that programs listed here include only those that are exclusive to the Virginia Campus. Programs offered at this and other sites are listed by academic department. Contact the Virginia Campus office for complete information on programs at this site.

EXECUTIVE MASTER OF SCIENCE IN INFORMATION SYSTEMS TECHNOLOGY

Executive Master of Science in Information Systems Technology—A unique, weekend-oriented program for high-potential, mid-level managers and senior executives, offered by the School of Business. The 36-credit-hour multidisciplinary curriculum focuses on the role of information systems and behavioral and decision sciences in problem solving and decision making. The program is designed to meet the needs of individuals from a variety of professional and educational backgrounds. Applicants generally are expected to have a minimum of seven years of professional experience and a bachelor's degree with a *B* or better average from a regionally accredited college or university. Program participants represent a broad range of public and private sector organizations that have included president, senior marketing specialist, division director, senior engineer, senior systems architect, program manager, and consultant.

The program enrolls one student cohort per year, with a fixed sequence of courses during the 15-month accelerated program. Classes meet on alternating Fridays and Saturdays. The faculty consists of a core of full-time professors, augmented by recognized leaders in particular disciplines and distinguished guest lecturers from government and industry. The management science courses listed below are offered at the Virginia Campus only and are available to Executive Master's students only.

MANAGEMENT SCIENCE

401 **Individual and Group Decision Processes** (3)
Study of the individual and group processes in decision making in organizations. Topics include decision effectiveness, decision analysis techniques, group dynamics, and managerial style as related to decision making.

402 **Quantitative Methods for Information Systems** (3)
Introductory study of quantitative techniques for problem solving. Statistical concepts, including confidence intervals, hypothesis testing, correlation, and

regression. Linear programming. Applications and case studies involving management information systems.

404 **Enterprise Networks in Organizations** (3)
The role of data communications and networking within organizations. LANs and interconnecting LANs to create enterprise networks. Emerging technologies such as videoconferencing, multimedia, and ATM. The interaction between networks and MIS as typified by client-server architectures is emphasized.

405 **Database Systems** (3)
Application and implementation of database management systems in the public and private sectors. Database organization, creation, maintenance, and management. Client–server technology. Review of commercial database management systems.

406 **Decision Support Systems and Methods** (3)
Computer-based decision-making aids and simulations. Issues in effective implementation of decision support systems. Review and analysis of various expert systems, including tools and generators, classification vs. diagnostic type systems, and building modules. Design of decision support and expert systems.

407 **Introduction to MIS Business Relationships** (3)
Introduction to MIS business solutions. Integration of MIS into the business and organizational environment. Case studies of various organizational structures and MIS needs and solutions. Economic analysis of MIS applications.

408 **Strategic Planning and Business Process Engineering** (2)
Development and implementation of a long-range organizational strategy. Business process engineering and re-engineering. Technology assessment and technical management, use of critical success factors. Innovative uses of MIS in organizations.

410 **Information Systems Security** (2)
Network and MIS security issues. Risk assessment, technological and procedural security measures. Computer fraud and privacy issues. Hacker attacks, phone fraud, denial of service, and virus and work attacks.

411 **Information Systems Design** (4)
Introduction to the design and analysis of information systems. The systems development life cycle, analysis of requirements, design of logical systems, analysis and design of user interfaces, system documentation and specifications. Planning for system implementation, evaluation, and maintenance.

412 **The Information System Development Process** (2)
Management decisions and activities during the life cycle of an information system. Project estimation and planning for information systems. Contractual issues in system development and acquisition. Requirements analysis, systems analysis, development, testing, and maintenance. Rapid prototyping, spiral model development, and alternative development strategies.

490 **Special Topics** (1 to 3)

EXECUTIVE LEADERSHIP IN HUMAN RESOURCE DEVELOPMENT

Doctor of Education in the field of human resource development—Prerequisite: A master's degree from an accredited college or university, three years of full-time experience in human resource development, and the general requirements for admission to Ed.D. degree candidacy stated under the Graduate School of Education and Human Development.

The program provides a forum through which doctoral Fellows, their organizations, and the University can build leadership in human resource development and bring about significant change within cooperating organizations. Fellows move through the program in a cohort group. Each cohort is a deliberate mixture of professionals from diverse industries as well as government and from a variety of geographic locations across the United States.

The program focuses on six themes that correspond to semesters, followed by work toward the dissertation. Class sessions are held one weekend a month (Friday and Saturday) for a period of two and a half years. A week-long session begins the program and an additional two-week session takes place each subsequent year. The specific time period for completing the dissertation varies.

Leadership—Fellows gain an understanding of pivotal theories of leadership and apply these theories to their own organizations. Empowerment, team development, integrity,

and systems thinking are explored. There is an emphasis on the personal leadership development of the Fellows within the program.

The Learning Organization—Fellows focus on learning at both the individual and system level. Learning theory, critical thinking, and organizational learning are explored. Fellows engage in action learning projects that address a problem within their own organizations.

Research—Fellows survey the depth and breadth of current research in human resource development, focusing on areas of particular interest to themselves and their organizations and developing research skills in both quantitative and qualitative methods.

The Changing Environment—Fellows address current change theory and understanding and implementing of change in an organizational setting. Forces influencing change, such as diversity and globalization, are examined.

Integration and Application of Central Concepts—Fellows seek to integrate the knowledge they have gained in the program by applying it to a project within their own or an exchange organization. This process serves both to provide a real-world application of their knowledge and an opportunity to expand it.

Specialization; Developing In-Depth Knowledge—Fellows focus on one or two specific areas of study relevant to their organizations, themselves, and the field. Examples of topic areas are the impact of technology, autonomous work teams, retraining the work force, or the implementation of total quality management.

Fellows are required to research, write, and defend a dissertation. This research effort is an opportunity for each Fellow to make a significant contribution to the field of human resource development. The student continues to register for Dissertation Research (HRD 391) until the final oral examination has been successfully completed.

WOMEN'S STUDIES

Professors D. Bell, H. Hartmann (*Research*), P.M. Palmer, B. Gault (*Research*)
Associate Professors C.E. Harrison, C. Deitch, D. Moshenberg (*Director*)
Assistant Professors A. Zucker, K. Pemberton
Adjunct Assistant Professors M. Frost, B. Morris
Lecturer N. Turner

Committee on Women's Studies
D. Bell, N. Cahn, C. Deitch, C. Gamber, B. Gault, C.E. Harrison, H. Hartmann, L. Jacobson, N. Mikhalevsky, D. Moshenberg, P.M. Palmer, A. Romines, G. Weiss, S. Wolchik, A. Zucker

Columbian College of Arts and Sciences offers two interdisciplinary programs leading to the degrees of Master of Arts in the field of women's studies and Master of Arts in the field of public policy with a concentration in women's studies. Both programs are also available as part of J.D.–M.A. and LL.M.–M.A. joint degrees with the GW Law School. A graduate certificate in women's studies is offered as well. Programs are directed by the Committee on Women's Studies and draw upon faculty from various departments within the University and resource persons in the community.

The women's studies programs examine and integrate the contributions of established academic disciplines to provide an understanding of the historical and contemporary role and status of women, and to provide training necessary to evaluate and formulate equitable public policy for women. Each student will work closely with an advisor in designing a program to meet individual research interests and professional goals. Prospective degree candidates should consult with the director of the Women's Studies Program.

Master of Arts in the field of women's studies and *Master of Arts in the field of public policy with a concentration in women's studies*—Prerequisite: a bachelor's degree from an accredited college or university.

Required: the general requirements stated under Columbian College of Arts and Sciences, and 36 credit hours of course work, with or without a thesis. Policy-oriented students take WStu 221, 240, and 220, plus four courses in the public policy core (PSc 203, 229; Econ 217; and an approved statistical methods course) and 9 hours of electives. Those pursuing the Master of Arts in the field of women's studies must take WStu 220, 221, and either 225 or an approved alternative; 12 credit hours in one other discipline (history, literature, economics, philosophy, religion, anthropology, or sociology); and 9 hours of electives. With permission, other disciplinary or topical concentrations may be

selected. All students take a final 6 hours chosen from WStu 299–300, or 283 and 295. All candidates are required to pass a Master's Comprehensive Examination.

The M.A. program in the field of public policy is affiliated with the School of Public Policy and Public Administration.

Note: Excluding students enrolled in the Women's Studies Program, completion of WStu 120 and 125 or equivalent, or permission of instructor, is prerequisite to all graduate-level women's studies courses.

220 **Fundamentals of Feminist Theory** (3) Palmer and Staff
Same as AmSt 220. A survey of historical theories significant to feminist thought, such as liberalism, socialism, evolution, psychoanalysis, and gendered spheres of social action. How these theories were revived and revised by the Second Wave of feminism since the 1960s. Brief examination of postmodernist and Third Wave feminist theorizing. (Fall)

221 **Research Issues in Women's Studies** (3) Deitch
Analysis of the contribution of feminist or gender-relations perspectives from humanities and social science disciplines to the issues and methods of social research and social policy and practice. Topics include a review of feminist frameworks, a critique and re-evaluation of traditional academic disciplines, and analysis of current research on and for women. (Fall)

225 **Contemporary Feminist Theory** (3) Staff
Developments in feminist theory in the past 20 years, with a primary focus on American feminism and some consideration of European and Third World thought.

230 **Global Feminisms** (3) Bell and Staff
The individuals, groups, and policies that shape global agenda for women; local and international fora in which global feminisms are forged.

238 **Feminist Ethics and Policy Implications** (3) Weiss
Same as Phil 238.

240 **Women and Public Policy** (3) Harrison, Deitch
Analysis of gender-related U.S. policy issues, such as domestic violence, military service, abortion rights, equal employment opportunity, child and dependent care, welfare, social security, and international development assistance. (Spring)

241 **Women and the Law** (3) Harrison
Legal status of women in the United States on both the federal and state levels. Emphasis on constitutional equality, employment law, family law, reproduction and sexuality, and the criminal justice system. (Fall)

244 **Sexuality in U.S. History** (3) Staff
Same as AmSt/Hist 244.

251 **Women and Writing** (3) Staff
Same as Engl 251.

257 **Gender and Sexuality** (3) Bell
Same as Anth 257.

265 **Women, Welfare, and Poverty** (3) Deitch, Harrison
Examination of how the causes and consequences of poverty differ for women and men; how race, class, and gender shape policy responses to poverty. The history of family assistance policy in the United States and the impact of various welfare reform efforts. Same as Soc 265. (Fall)

266 **Gender and Criminal Justice** (3) Staff
Same as Soc 266.

268 **Race, Gender, and Class** (3) Deitch, Kennelly
Same as Soc 268.

270 **Seminar: Selected Topics** (3) Staff
Investigation of a current policy issue of particular concern to women, or consideration of women's status in a particular social system. Topics have included women and health; sexualities; women and Judaism; black women; gender, race, and class. May be repeated for credit. (Fall and spring)

273 **Readings on Women in American History** (3) Harrison
Same as AmSt/Hist 273.

275 **Women and Health** (3) Zucker
Theoretical and empirical analyses of women's health: how women's health is constructed by medical, psychological, and critical theorists; how sexism,

racism, and classism contribute to women's health problems; and identification of conditions that lead to optimal health and well-being. Same as Psyc 275.

280 **Independent Study** (3) Staff
May be repeated for credit. Arrangements must be made with sponsoring faculty member prior to registration.

283 **Practicum in Women's Studies** (3 to 6) Deitch
Study of the changing status of women through supervised assignment to public and private agencies engaged in policymaking, education, political action, and research. Placement arrangements must be made the semester prior to registration; departmental permission is required. May be repeated for credit to a maximum of 6 credits. (Spring)

295 **Independent Research in Women's Studies** (arr.) Staff
Individual library or field research. Arrangements must be made with the sponsoring faculty member prior to registration; a written proposal is required.

299–300 **Thesis Research** (3–3) Staff

Faculty

FACULTY AND STAFF OF INSTRUCTION 2004–2005

(as of Fall 2004)

Columbian College of Arts and Sciences

School of Business

Graduate School of Education and Human Development

School of Engineering and Applied Science

Elliott School of International Affairs

EMERITI

Fred Paul Abramson, *Professor Emeritus of Pharmacology*
B.A. 1962, Case Western Reserve University; Ph.D. 1965, Ohio State University

Lewis Francis Affronti, *Professor Emeritus of Microbiology and Immunology*
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Frederick Amling, *Professor Emeritus of Business Finance*
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B.S. 1957, Simmons College; M.A. 1965, American University

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B.A. 1961, Swarthmore College; Ph.D. 1964, Johns Hopkins University

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B.S. 1948, Carnegie Institute of Technology; M.S. 1956, North Carolina State University; M.S. 1966, Ph.D. 1972, Stanford University

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B.S. 1964, University of Notre Dame; M.A. 1966, Ph.D. 1968, Brandeis University

James Edward Falk, *Professor Emeritus of Operations Research*
B.E.E. 1960, University of Detroit; M.S. 1961, Ph.D. 1965, University of Michigan

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B.S. 1950, University of Alberta, Canada; M.S. 1955, University of London; Ph.D. 1966, Cambridge University

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B.A. 1950, Union College, New York; Ph.D. 1967, Northwestern University

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Ph.D. 1957, University of Industrial Chemistry, Polytechnical Institute, Romania; Ph.D. 1964, M.D. 1975, George Washington University

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B.S. in Com. 1948, University of Virginia; M.B.A. 1949, University of Pennsylvania

Jerry Lee Lake, *Professor Emeritus of Photography*
B.F.A. 1966, Virginia Commonwealth University; M.F.A. 1968, Ohio University

Carl James Lange, *Professor Emeritus of Psychology*
B.S. 1945, Duke University; M.S. 1948, Ph.D. 1951, University of Pittsburgh

Phyllis Ann Langton, *Professor Emeritus of Sociology*
B.A. 1961, M.A. 1962, California State University, Los Angeles; Ph.D. 1968, University of California, Los Angeles

Thelma Z. Lavine, *Elton Professor Emeritus of Philosophy*
B.A. 1936, Radcliffe College; M.A. 1937, Ph.D. 1939, Harvard University

Hugh Linus LeBlanc, *Professor Emeritus of Political Science and Public Affairs*
B.A. 1948, Louisiana State University and Agricultural and Mechanical College; M.A. 1950, University of Tennessee, Knoxville; Ph.D. 1958, University of Chicago

Myrna Pike Lee, *Associate Professor Emeritus of Mathematics*
B.A. 1957, Cornell University; M.S. 1959, Ph.D. 1962, University of Illinois

John Frederick Lewis, *Professor Emeritus of Geology*
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DEGREES OFFERED BY THE GEORGE WASHINGTON UNIVERSITY

Columbian College of Arts and Sciences: Bachelor of Arts (B.A.), Bachelor of Fine Arts (B.F.A.), Bachelor of Science (B.S.), Master of Arts (M.A.), Master of Fine Arts (M.F.A.), Master of Forensic Sciences (M.F.S.), Master of Public Administration (M.P.A.), Master of Public Policy (M.P.P.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.), and Doctor of Psychology (Psy.D.)

School of Medicine and Health Sciences: Bachelor of Science in Health Sciences (B.S.H.S.), Master of Science in Health Sciences (M.S.H.S.), and Doctor of Medicine (M.D.)

Law School: Juris Doctor (J.D.), Master of Laws (LL.M.), and Doctor of Juridical Science (S.J.D.)

School of Engineering and Applied Science: Bachelor of Science (B.S.), Bachelor of Arts (B.A.), Master of Engineering Management (M.E.M.), Master of Science (M.S.), Engineer (Engr.), Applied Scientist (App.Sc.), and Doctor of Science (D.Sc.)

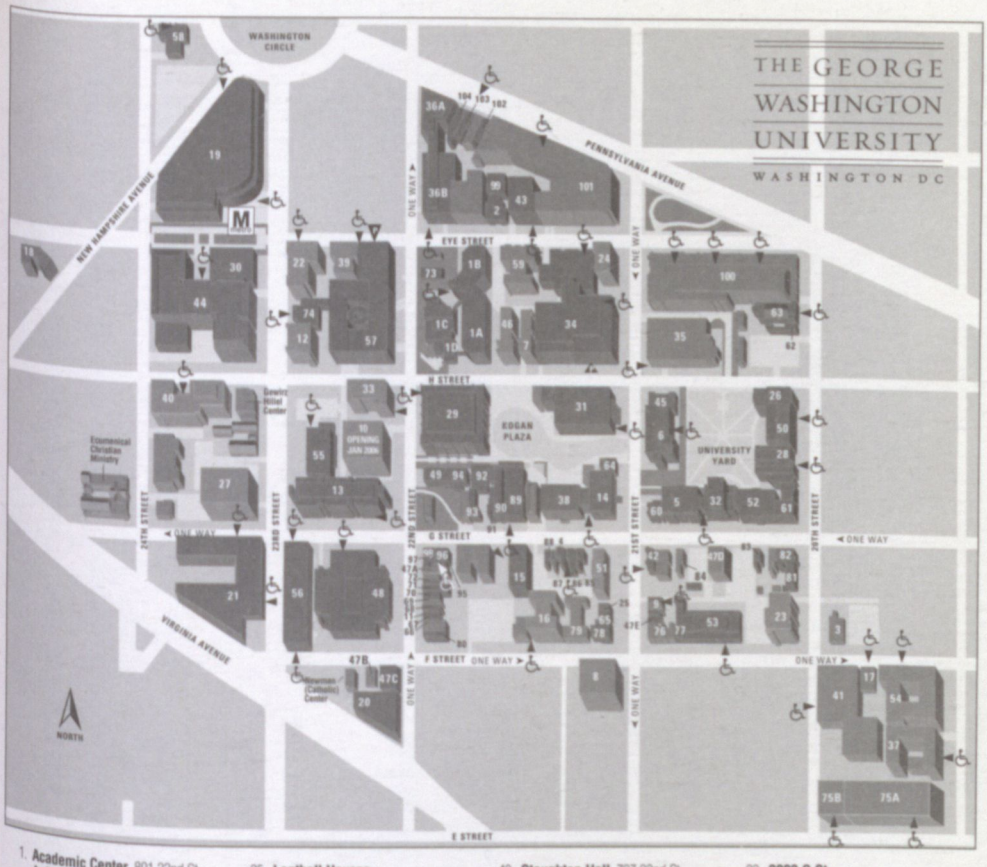
Graduate School of Education and Human Development: Master of Arts in Education and Human Development (M.A. in Ed.&H.D.), Master of Arts in Teaching (M.A.T.), Master of Education (M.Ed.), Education Specialist (Ed.S.), and Doctor of Education (Ed.D.)

School of Business: Bachelor of Accountancy (B.Accy.), Bachelor of Business Administration (B.B.A.), Master of Accountancy (M.Accy.), Master of Business Administration (M.B.A.), Master of Science in Finance (M.S.F.), Master of Science in Information Systems Technology (M.S.I.S.T.), Master of Science in Project Management (M.S.P.M.), Master of Tourism Administration (M.T.A.), and Doctor of Philosophy (Ph.D.)

Elliott School of International Affairs: Bachelor of Arts (B.A.), Master of Arts (M.A.), Master of International Policy and Practice (M.I.P.P.), and Master of International Studies (M.I.S.)

School of Public Health and Health Services: Bachelor of Science (B.S.), Master of Science (M.S.), Master of Public Health (M.P.H.), Master of Health Services Administration (M.H.S.A.), Specialist in Health Services Administration (Spec.H.S.A.), and Doctor of Public Health (Dr.P.H.)

College of Professional Studies: Associate in Professional Studies (A.P.S.), Bachelor of Professional Studies (B.P.S.), and Master of Professional Studies (M.P.S.)



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   A. Phillips Hall
   B. Rome Hall
   C. Smith Hall of Art
   D. Visitor Center
2. **John Quincy Adams House**
   2129-33 Eye St.
3. **Alumni House**, 1925 F St.
4. **Hortense Amsterdam House**
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5. **Bell Hall**, 2029 G St.
6. **Corcoran Hall**, 725 21st St.
7. **Crawford Hall**, 2119 H St.
8. **Dakota**, 2100 F St.
9. **Davis-Hodgkins House**
   609 21st St.
10. **Ric and Dawn Duques Hall**
    2201 F St.
11. **Abba Eban House**, 607 22nd St.
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13. **Funger Hall**, 2201 G St.
14. **Government, Hall of**, 710 21st St.
15. **GSEHD**, 2134 G St.
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17. **The George Washington University Club**, 1918 F St.
18. **The George Washington University Inn**
    824 New Hampshire Ave.
19. **Hospital, GW**, 900 23rd St.
20. **International House**
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21. **Ivory Tower Residence Hall**
    616 23rd St.
22. **Kennedy Onassis Hall**
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23. **Francis Scott Key Hall**
    600 20th St.
24. **Lafayette Hall**, 2100 Eye St.
25. **Lenthall Houses**
    606–610 21st St.
26. **Lerner Hall**, 2000 H St.
27. **Lerner Health and Wellness Center**, 2301 G St.

LIBRARIES

28. **Jacob Burns** (Law), 716 20th St.
29. **Melvin Gelman** (University), 2130 H St.
30. **Paul Himmelfarb Health Sciences** (Medical), 2300 Eye St.
31. **Lisner Auditorium**, 730 21st St.
32. **Lisner Hall**, 2023 G St.
33. **Madison Hall**, 736 22nd St.
34. **Marvin Center**, 800 21st St.
35. **Media & Public Affairs**
    805 21st St.
36. **Medical Faculty Associates**
    2150 Pennsylvania Ave.
    A. H.B. Burns Memorial Bldg.
    B. Ambulatory Care Center
37. **Mitchell Hall**, 514 19th St.
38. **Monroe Hall**, 2115 G St.
39. **Munson Hall**, 2212 Eye St.
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41. **Old Main**, 1922 F St.
42. **Quigley's**, 619 21st St.
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44. **Ross Hall**, 2300 Eye St.
45. **Samson Hall**, 2036 H St., 729 21st St.
46. **Schenley Hall**, 2121 H St.
47. **Scholars Village Townhouses**
    A. 619 22nd St.
    B. 2208 F St.
    C. 520-526 22nd St.
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    E. 605-607 21st St.
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49. **Staughton Hall**, 707 22nd St.
50. **Stockton Hall**, 720 20th St.
51. **Strong Hall**, 620 21st St.
52. **Stuart Hall**, 2013 G St.
53. **Support Building**, 2025 F St.
54. **Thurston Hall**, 1900 F St.
55. **Tompkins Hall of Engineering**
    725 23rd St.
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58. **Warwick Bldg.**, 2300 K St.
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61. **700 20th St.**
62. **812 20th St.**
63. **814 20th St.**
64. **714 21st St.**
65. **600 21st St.**
66. **603 22nd St.**
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68. **609 22nd St.**
69. **611 22nd St.**
70. **613 22nd St.**
71. **615 22nd St.**
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90. **2127 G St.**
91. **2129 G St.**
92. **2129 G St.** (rear)
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95. **2136 G St.**
96. **2138 G St.**
97. **2140 G St.**
98. **2142 G St.**
99. **2129-33 Eye St.** (rear)
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101. **2100 Pennsylvania Ave.**
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103. **2140 Pennsylvania Ave.**
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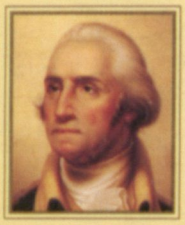
P Visitor parking entrance



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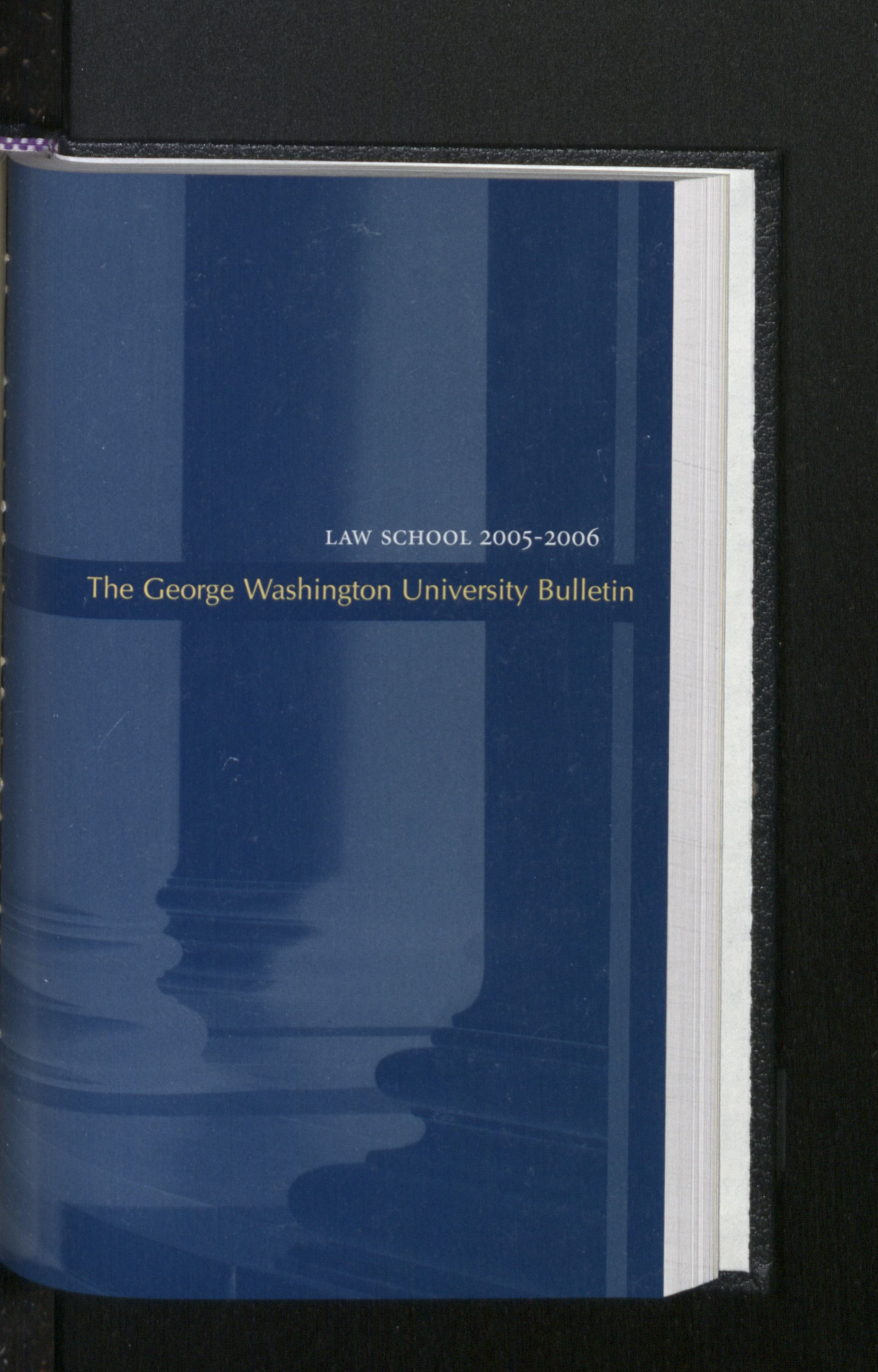

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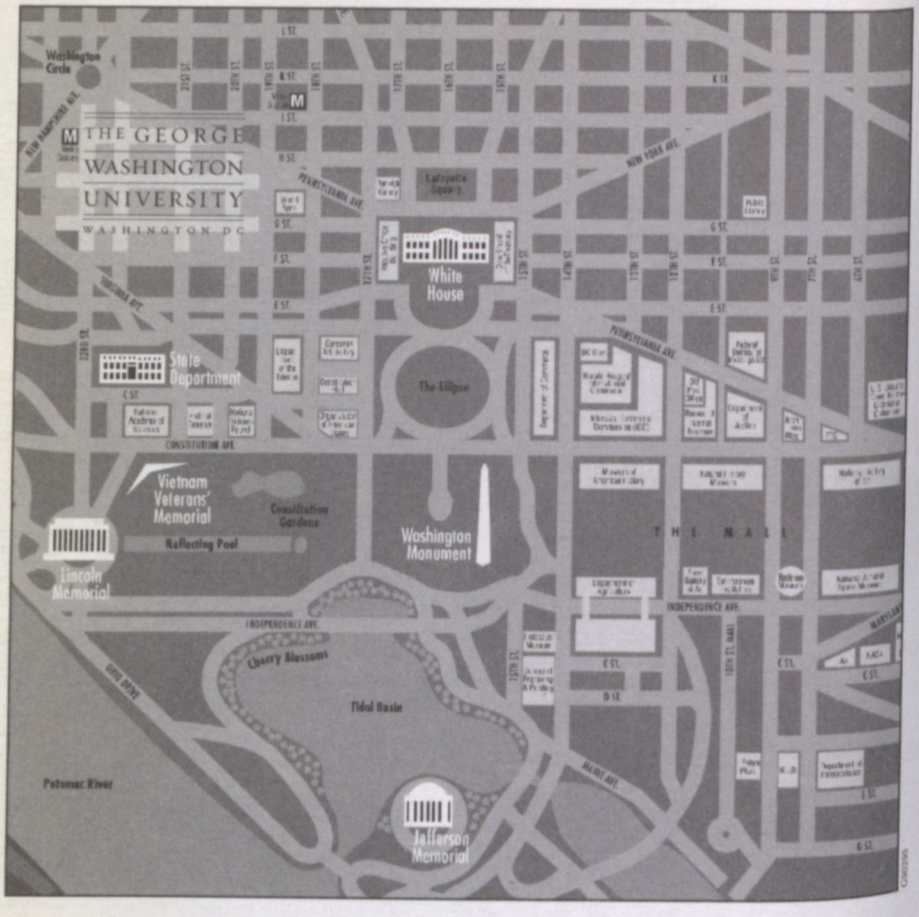

THE GEORGE WASHINGTON UNIVERSITY BULLETIN
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THE GEORGE WASHINGTON UNIVERSITY BULLETIN

LAW SCHOOL
2005–2006

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The University reserves the right to change courses, programs, fees, and the academic calendar, or to make other changes deemed necessary or desirable, giving advance notice of change when possible.

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The Academic Calendar 2005–2006

2005 Fall Semester

August 22	Classes begin for 1L, Evening 2L, and non-U.S. LL.M. students
	Fall Interview Program begins for upperclass J.D. students
August 29	Classes begin for upperclass J.D. and U.S. LL.M. students
September 5	Labor Day holiday (no classes held)
September 6	Last day of Drop/Add
September 16	Deadline for Credit/No Credit Option
October 17	1L Day reading day
October 18	1L Day midterm examinations
October 19–21	1L Day fall recess
November 22	Constructive Friday (all Friday classes held)
November 23–25	Thanksgiving recess
December 1	Last day of fall semester classes
December 2–5	Reading period or snow days
December 6–16	Examination period

2006 Spring Semester

January 9	Classes begin for all students
January 16	Martin Luther King, Jr. Day holiday (no classes held)
January 17	Last day of Drop/Add
January 27	Deadline for Credit/No Credit Option
February 20	Presidents Day holiday (no classes held)
March 6–10	Spring recess (no classes held) for all students except evening 1L's
April 18	Constructive Monday (all Monday classes meet)
	Last day of spring semester classes
April 19–21	Reading period or snow days
April 24–May 5	Examination period
May 21	Commencement

The George Washington University Law School

History

The George Washington University Law School, the oldest law school in the District of Columbia, was established in 1865 with a formal program of two years of study. This was largely through the efforts of the Reverend Whitefield Samson, President of Columbian College, whose action resulted in the purchase of a separate building for holding law classes. The building had belonged to Trinity Church, of which Francis Scott Key had been Senior Warden. It was occupied by the Law School until 1884.

Sixty graduates, from 22 of the then 37 states, received degrees in 1867. The school continued to have a student body and a faculty that reflected the fact that it was at the seat of our nation's government. Supreme Court Justices David J. Brewer and John Marshall Harlan were among the prominent members of the bench and bar who were on the faculty.

In 1877, one year after the first such program was adopted in the United States, the Law School instituted a course leading to the degree of Master of Laws. In 1898, the course of instruction for the degree of Bachelor of Laws was extended to three years. The Law School took part in 1900 in the organization of the Association of American Law Schools.

In the past half-century the Law School expanded its course and seminar offerings with consideration of the needs of first-degree and graduate students. The degree of Doctor of Juridical Science was instituted in 1940. In 1946, the Law School began accepting foreign attorneys into specially designated programs. Today, lawyers from other countries are accepted into the Master of Laws program.

In 1954, the National University School of Law, which had held an important place in legal education in the District of Columbia since 1869, was absorbed by The George Washington University Law School.

Since 1954, special programs of advanced study have enriched the basic curriculum. At present these include Environmental Law; Intellectual Property Law; International and Comparative Law; Government Procurement Law; and Litigation and Dispute Resolution. These special programs reflect the breadth in public law for which the Law School is well known. Additionally, a clinical law program has been developed that is the equal of that at any law school in the nation.

Location in the Nation's Capital

Of special significance is the location of the Law School in a central area of the nation's capital, the focal point of the law in action, both U.S. and international. The work of the school goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative. Readily accessible are the Supreme Court of the United States, the federal trial and appellate courts of the District of Columbia, and federal courts of special jurisdiction, such as the United States Court of Appeals for the Federal Circuit, the United States Tax Court, and the United States Court of Appeals for the Armed Forces. Current federal legislation can be studied as it is considered by Congressional committees and as it comes up for debate on the floors of the House of Representatives and the Senate. With respect to the federal administrative agencies, students here in Washington have matchless opportunities for study and observation. They can attend informal and formal hearings of these agencies and can obtain from the docket sections complete records of administrative adjudication in specific cases. Illustrative of such federal agencies are the Interstate Commerce Commission in the field of transportation; the Federal Trade Commission in the field of trade regulation; the Securities and Exchange Commission in the field of security issues and corporate finance; the National Labor Relations Board

in the field of labor–management relations; the United States Patent Office in the field of patent law; the Federal Energy Regulatory Commission in the field of water, natural gas, and electric power; and the Federal Communications Commission in the field of radio and television.

Supplementing these environmental advantages of law in action are the exceptional research library collections in the Library of Congress, in the various departments of the federal government, and in the libraries of the headquarters of national and international organizations. The notable library of the Carnegie Foundation for International Peace has been acquired by The George Washington University for use by research students in international and comparative law.

The years of residence at law school are years of participation in the life of the community, which in the case of The George Washington University Law School is the government of the United States. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

Objectives

The purpose of the Law School is to prepare men and women to meet the needs of society in many fields of law and to encourage scholarly research and writing in the law. The Law School does not emphasize any particular geographic area in its instruction; therefore, it prepares students to practice law in any part of the country. The Law School seeks to fulfill these objectives through a rich and varied curriculum taught by eminent professors and highly qualified specialized instructors; an extensive clinical law program in which students learn legal skills by actual practice; four law journals that specialize in public law, intellectual property law, government contracts law, and international law; trial practice; participation in both intra- and interscholastic trial and appellate level moot court competitions; a series of student professional co-curricular activities; studies on an advanced level for students from the U.S. and abroad; a continuing legal education program for members of the bar, providing them with opportunities for course work within the curriculum; and scholarly research and writing in the law.

Student Body

The Law School has a total enrollment of about 1,875 students. Approximately 1,310 students are in the full-time day division for the J.D. degree and 265 are enrolled in the part-time evening division; 300 students, many from abroad, are enrolled in graduate law degree programs.

The Juris Doctor Degree

Entrance Requirements

To be considered for admission as a candidate for the Juris Doctor degree, an applicant must have a bachelor's degree awarded by a regionally accredited U.S. college or university or equivalent degree from a recognized non-U.S. institution and must have taken the Law School Admission Test (LSAT) within the past three years. There are no inflexible standards for admission, nor are there minimum grade-point averages or LSAT scores. However, students whose undergraduate records and LSAT scores indicate a high probability of success in law study are more likely to be admitted. Other factors in the admission decision include the undergraduate school attended, the student's major and trend in grades, personal achievements, and letters of recommendation, if submitted. The Law School also seeks social, ethnic, cultural, and geographical diversity in its student body.

Information concerning the Law School Admission Test may be obtained from the Law School's Admissions Office or from the Law School Admissions Council (LSAC) at www.lsac.org. The test is administered at various centers in the United States. Testing dates are usually in October, December, February, and June. Completed application forms must be received by LSAC at least one month before the date of the test.

Admission

Applicants to the J.D. degree program may apply to attend the full-time day division or the part-time evening division. Beginning J.D. degree students may matriculate only in the fall semester. Because admission decisions are made on a rolling basis, applicants are urged to submit application forms and complete credentials well in advance of the March 1 deadline. This means that the Law School Admission Test should be taken no later than December. Application forms are available at and should be returned to the Office of Admissions, The George Washington University Law School, Washington, D.C. 20052.

The applicant should register with the Law School Data Assembly Service (LSDAS) by completing and mailing the registration forms supplied by LSAC. A transcript from each college or university attended should then be sent directly to LSDAS, Box 2000-M, Newtown, Pennsylvania 18940. The LSDAS will analyze the transcript(s) and send a copy to this law school and others that ordered a report. However, the applicant will be asked, upon acceptance, to submit directly to the Law School a final official transcript showing evidence of the receipt of a bachelor's degree.

Advanced Standing (Transfer Students)

A limited number of places is available for students who wish to transfer to the Law School after completing one year of legal studies at a law school accredited by the American Bar Association. A maximum of 28 credit hours may be applied to the Law School's degree requirements. The primary factor considered in an admission decision is the student's first-year performance. No applicant will be accepted for transfer who is ineligible to return in good standing to a previously attended law school. Transfer students may apply for admission to the Law School for either the fall or spring semester. The deadlines for submission of transfer applications are July 1 for the fall semester, December 1 for the spring semester.

The Law School publishes a supplement to the Bulletin that summarizes academic rules and regulations that apply to transfer students; all students who transfer to the Law School are responsible for conforming to its requirements. The supplement is usually provided to students upon their admission.

Non-U.S. Law School Graduates

A limited number of graduates of non-U.S. law schools who wish to prepare for law practice in the United States may be admitted to the Juris Doctor program. A student in this program who completes 28 credit hours of course work at this law school with a grade-point average of 2.0 or above may petition the Academic Scholarship Committee to be granted 28 hours of advanced standing for law studies outside the U.S. and thereby earn the J.D. degree in two years. A student whose average is below 2.0 after taking 28 hours of course work must complete the full J.D. program, which requires 84 hours of course work.

Students will be admitted to this program only at the start of the fall semester. The deadline for application materials is March 1, but applicants are encouraged to submit applications well in advance of the deadline.

Visiting (Unclassified) Students

A law student who is in good academic standing as a degree candidate at an ABA-approved law school may be admitted to the Law School as an unclassified student and earn credit for transfer to his or her law school. Students may apply for visiting student status during the fall, spring, or summer semester. Admission will be based on the availability of space. The deadlines for application materials are July 1 for the fall semester, December 1 for the spring semester, and May 18 for the summer session.

Degree Requirements

In order to earn the Juris Doctor degree, students must satisfactorily meet the following academic requirements: Completion of 84 credit hours, 63 of which must have been taken for a letter grade; fulfillment of the residence requirement; completion of each course in the required curriculum with a passing grade; and maintenance of the minimum grade-point average of 1.67.

Course Scheduling Requirements for Full- and Part-Time Status

Full-time students (i.e., those registered for 12 or more credits in any semester) must take the majority of their credits in courses in the day unless an exception for good cause is granted by the dean of students. Registration in journals, skills competitions, outside placement, and clinical courses count as day credits. After completing courses in the required first-year curriculum, which must be taken in the evening, part-time students (i.e., those registered for a maximum of 11 credits) may take courses in the day or evening.

Transfer Between Full- and Part-Time Divisions

After the first semester, students may, with the permission of the dean of students, transfer from one division to another, but should be aware that there may be residency consequences.

Students initially admitted to the part-time division may, with the permission of the dean of students, transfer to the full-time division as early as their second semester. Students who are permitted to pursue this option after completion of the first semester must take all required courses in the evening (except *Professional Responsibility and Ethics,* which may be scheduled as the student chooses after completion of two semesters of the required first-year curriculum, and *Criminal Law,* which may be taken in the day during the spring semester of the first year), unless an exception is granted by the dean of students. In addition, such students must make up 4 or more credit hours during summer sessions in order to fulfill residency and other degree requirements and be eligible to graduate in three years.

See Residence, Required Curriculum, and Academic Work Load, below, for regulations governing the full-time and part-time divisions and the full-time/part-time option.

Residence

Candidates for the Juris Doctor degree must complete 6 units of residency in order to graduate. A student who is enrolled full time during the entire course of his or her program of study will accumulate 6 residency units in 6 semesters. A student who is enrolled part time during the entire course of his or her program of study and who has paid the equivalent of 84 or more credit hours of tuition will be deemed to have satisfied the residency requirement for graduation. Students who switch between full- and part-time status will accumulate residency units based on the number of credit hours taken each semester or summer session. Students should seek the advice of the dean of students concerning fulfillment of this requirement.

Credit hours are equivalent to residency units as follows:

Full-time status
12+ credits = 1 unit

Part-time status
11 credits = .8 units
10 credits = .7 units
9 credits = .65 units
8 credits = .6 units
7 credits = .5 units
6 credits = .4 units
5 credits = .35 units
4 credits = .3 units
3 credits = .2 units
2 credits = .15 units
1 credit = .075 units

Required Curriculum

Full-Time Day Division

Full-time students in the day division must take the following schedule in their first year: fall semester—*Contracts I, Torts, Criminal Law, Civil Procedure I,* and *Legal Research and Writing;* spring semester—*Contracts II, Property, Constitutional Law I, Civil Procedure II,* and *Introduction to Advocacy.*

During the second or third year of study, all full-time day division students must take *Professional Responsibility and Ethics* and fulfill the two-credit legal writing requirement.

Part-Time Evening Division

Part-time evening division students must take the following schedule in their first and second years: first year, fall semester—*Contracts I, Civil Procedure I,* and *Legal Research and Writing;* first year, spring semester—*Contracts II, Civil Procedure II, Torts,* and *Introduction to Advocacy;* second year, fall semester—*Property, Criminal Law, Constitutional Law I;* second year, spring semester—electives.

Some required and elective courses will meet on Friday evenings in the fall and spring semesters.

During their second, third, or fourth year of study, all part-time evening division students are required to take *Professional Responsibility and Ethics* and fulfill the two-credit legal writing requirement.

Part-Time/Full-Time Option

With the permission of the dean of students, students initially admitted to the part-time division may transfer to the full-time division as early as their second semester. Students who choose to do so will customarily take the following schedule in their first and second years: first year, fall semester evening courses—*Contracts I, Civil Procedure I, Legal Research and Writing;* first year, spring semester evening courses—*Contracts II, Civil Procedure II, Torts, Introduction to Advocacy;* first year, spring semester day course—*Criminal Law;* summer session—*Property;* sec-

ond year, fall semester evening course—*Constitutional Law I* and electives in the day or evening, subject to certain restrictions; second year, spring semester—electives in the day or evening, subject to certain restrictions.

During their second or third year of study, students pursuing this option must take *Professional Responsibility and Ethics* and fulfill the two-credit legal writing requirement.

Additional information concerning transfer to the full-time division is available from the dean of students, including other course scheduling options for completing degree requirements in three years.

Legal Writing Requirement

Completion of 2 credit hours that are graded on the basis of written work (not examination) is required for the Juris Doctor degree. This requirement may be satisfied by (1) satisfactory completion of Law 656, *Independent Legal Writing*, or a seminar or other course that requires or permits a research paper; or (2) satisfactory service on the *Law Review, International Law Review, American Intellectual Property Law Association Quarterly Journal,* or *Public Contract Law Journal.*

In order to satisfy the legal writing requirement, the written work product must be based on sound legal research, consist of a single paper of no less than 8,000 words including footnotes, conform to the legal citation rules recognized and adopted by the Law School, and receive a grade of *B–* or better. The course used to fulfill the legal writing requirement may be graded on a Credit/No Credit basis only under the following circumstances: (1) when the student, under extraordinary circumstances, is granted permission by the dean of students to elect to take the course under the Credit/No Credit Option, or (2) if the student is granted an extension beyond the deadline by the instructor. Under such circumstances, the student must receive a grade of *B–* for the work product in order to fulfill the legal writing requirement.

To satisfy the legal writing requirement through journal participation, the journal's faculty adviser must certify in writing that the work product meets the legal writing requirement. To satisfy the upper-level writing requirement through a two-credit independent legal writing project, the work must be supervised by a member of the faculty, and the student must submit the following for approval by the faculty member by specified dates: (1) the topic and length of the work product; (2) an outline of the work product; and (3) one or more drafts of the work product. The draft requirement is meant to provide a student the opportunity to improve the paper. The faculty member may require a revised draft or may permit one if so requested by the student. All drafts and the final work product must conform to legal citation rules and all rules outlined in the Law School publication *Citing Responsibly.* Failure to adhere to such rules may result in a violation of the Academic Integrity Code.

Academic Regulations

Academic Work Load

Juris Doctor candidates without substantial outside employment (no more than 20 hours a week) may take a program of studies of 15 credit hours per semester. After the first year of study, full-time students may take courses in the evening only if they take a majority of their hours in day courses. The dean of students is authorized to approve programs of study of more than 15 credit hours in exceptional cases; however, no program will be approved that would permit the student to complete requirements for the degree in less than 28 months after beginning the first year of law study. Students with more than 20 hours of outside employment must take a limited program of studies not exceeding 11 credit hours; the minimum load is 8 credit hours, except in special cases when fewer hours may be approved by the dean of students for a limited time. A minimum schedule of 12 credit hours is required for students to be considered full-time.

Juris Doctor students may take a maximum of 8 credit hours in each summer session. Of those credit hours, no more than a total of 6 may be earned at other law schools' summer programs (see Summer School Credit from Other Law Schools).

Student Employment

A student taking more than 11 hours of course work must limit outside employment to not more than 20 hours. All full-time students are urged to refrain from engaging in outside employment during their first year, and the Law School will not employ first-year students. Although work in some special areas may contribute to the learning and experience of the student, as a general rule it will compete with the time needed for adequate study and preparation, which are at the heart of a good legal education.

Academic Evaluation

Grades

Letter grades are given with numerical equivalents as follows.

A+ = 4.33	B+ = 3.33	C+ = 2.33	D = 1.0
A = 4.0	B = 3.0	C = 2.0	F = 0
A− = 3.66	B− = 2.66	C− = 1.66	

Credit toward the J.D. degree is given for all grades between *D* and *A*+ (inclusive). A J.D. candidate who receives a grade of *F* or No Credit in a required course must retake that course from the same or a different instructor. Any student who retakes a required course and receives a grade of *F* or No Credit will be excluded from further study and may not graduate unless the student petitions for and receives the permission of the Academic Scholarship Committee. A J.D. candidate who receives a grade of *F* in a non-required course may retake the course once, from the same or a different instructor, but only within the next academic year. All failing and No Credit grades remain on the record. The cumulative average of a student includes all grades earned in courses evaluated on a letter-grade basis and taken at the Law School while a candidate for the degree.

The majority of courses are graded on a letter-grade basis, but for a small number of courses, primarily those that are clinical or skills-oriented, the grade of *CR* (Credit) or *NC* (No Credit) is given or the following grading scale is used: *H* (Honors), *P* (Pass), *LP* (Low Pass), and *NC* (No Credit). For Honors, a student must do work of excellent quality, and no more than 25 percent of the class may earn this grade. For courses graded on a Credit/No Credit or Honors, Pass, Low Pass, or No Credit basis, No Credit is given for work that would receive a grade below *C*− were evaluation to be made using the letter grade scale.

A student who has been excused from taking a regularly scheduled examination or has been granted an extension of the deadline for a research paper is given the grade of *I*, Incomplete. (See Failure to Take an Examination, and Deadlines for Courses Graded on the Basis of Methods of Evaluation Other than In-Class Examinations, below.)

No grade may be changed by an instructor after it has been posted or disclosed to the student unless there has been an arithmetic or administrative error certified in writing as such by the instructor. A student has the right of faculty peer review of complaints of "capricious or prejudiced academic evaluation" under the regulations outlined in *The George Washington University Guide to Students' Rights and Responsibilities*. To initiate such a review, the student must submit a letter and supporting documentation to the senior associate dean for academic affairs by the last day of classes of the semester following the semester or summer session in which the grade for an examination, paper, or other work product was awarded. The student has the burden of making a prima facie case, with appropriate documen-

tation, that the grade was capricious or prejudiced. Mere disagreement with the grade is not a sufficient basis for initiating a faculty peer review.

Method of Evaluation

The method of evaluation is indicated at the end of each course description in this Bulletin, and a student's grade in the course will be determined in large part on that basis. In most courses, a final examination is held during the examination period. These courses are marked "examination." Additional written work requirements are indicated by notations such as "drafting assignments" or "problem assignments." A small number of courses are marked "take-home examination," indicating that the instructor will determine the method by which the examination is administered outside of the classroom.

Courses that require the preparation of a major research paper in lieu of an examination are marked "research paper." The satisfactory completion of such a paper by a student individually will satisfy the Legal Writing curriculum requirement for the J.D. degree. Some courses are marked "examination or research paper with permission of the instructor." In such cases an examination will be scheduled, but the instructor may grant permission for a number of students to write a research paper in lieu of the examination. Research papers satisfactorily completed in these courses will also satisfy the Legal Writing requirement for the J.D. degree.

Skills courses are usually graded on the basis of simulation, role-playing, and/or some form of written assignment and may be marked, for example, "drafting assignments" or "simulation and paper." In clinical courses no method of evaluation is indicated. In such courses it is the student's performance in carrying out his or her clinical responsibilities that forms the basis for the grade.

Participation—Once a student has been evaluated in a course using the method indicated in the course description, the instructor may raise or lower the student's grade on the basis of class participation. A student's grade may be raised or lowered by only one grade step for class participation, e.g., from *B* to *B*+, or *B* to *B*−.

Academic Recognition

The distinction of "George Washington Scholar" is indicated for those students whose cumulative grade-point average at the end of any semester places them among the top 15 percent of their class. The distinction of "Thurgood Marshall Scholar" is indicated for those students whose cumulative grade-point average at the end of the semester places them between the top 15 and 35 percent of their class. A notation of these distinctions is entered onto students' transcripts each semester after all grades have been reported in all courses.

Honors

The degree of Juris Doctor "With Highest Honors" is awarded to those students, not exceeding three percent of the graduating class, who have obtained the highest cumulative averages of at least 3.67.

The degree of Juris Doctor "With High Honors" is awarded to those students with the highest cumulative averages of 3.33 or better. The number of students receiving degrees "With High Honors," when added to the total number of students receiving degrees "With Highest Honors," may not exceed 10 percent of the graduating class.

The degree of Juris Doctor "With Honors" is awarded to those students with the highest cumulative averages of 3.0 or better. The number of students receiving degrees "With Honors," when added to the total number of students receiving degrees "With High Honors" and "With Highest Honors," may not exceed 40 percent of the graduating class.

For students who receive their degrees in September and January, eligibility for honors will be determined based upon the student's grade-point average in comparison with those students who graduated the previous May.

Order of the Coif

The Order of the Coif, a national legal honor society, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University chapter was established in 1926. Members are elected each year from the highest-ranking 10 percent of the graduating Juris Doctor candidates. Ordinarily, only students who have completed their full course of study in residence at the Law School are eligible for membership in the Order of the Coif. However, exceptions may be made by the Order of the Coif adviser for unusual circumstances. Any student admitted to the Law School as a transfer student after the first year of study will not be eligible. Similarly, students who take more than one semester of classes at another institution (excluding summer course work) will not be eligible.

Credit/No Credit Limit and Credit/No Credit Option

A number of the Law School's elective courses are graded on a Credit/No Credit basis or an Honors/Pass/Low Pass/No Credit basis. After the first year of study, students may take up to a total of 17 credit hours of courses graded on a Credit/No Credit or Honors/Pass/Low Pass/No Credit basis. Credits earned in *Legal Research and Writing* (216) and *Introduction to Advocacy* (217) do not count toward the 17-hour limit.

The Credit/No Credit option allows J.D. students to take up to 6 credit hours of non-required law courses that are regularly graded on a letter-grade basis on a Credit/No Credit basis. Course credit earned under the Credit/No Credit option counts toward the 17-hour limit. In courses where the Credit/No Credit option has been elected, the following rules apply: (1) the option may be elected for only one course during a semester or summer session; (2) the final day for an election of Credit/No Credit in a regularly graded course will be the Friday of the third week of a semester or summer session; (3) the decision to exercise the Credit/No Credit option is irrevocable after the final day of the Credit/No Credit election period; (4) a student must earn a grade of *C–* or better to earn Credit; if a student earns less than a *C–* in a course in which the option is exercised, a grade of *NC* will appear on the student's transcript; (5) an unexcused failure to take an examination or submit a required research paper in a course taken on a Credit/No Credit basis will result in a grade of *F*.

The Credit/No Credit option is intended to facilitate course experimentation. It is not a license for inadequate class preparation or participation. The faculty advises students to consider carefully whether to elect to take courses on a Credit/No Credit basis. Exercising the option may adversely affect employment opportunities because of the importance attached to grades by prospective employers. In addition, students should exercise great caution when electing the Credit/No Credit option during their final semester. Students who receive the otherwise passing grade of *D* in a course in which the *CR/NC* option is exercised in the final semester will receive no credit. Such students may not have sufficient credits to graduate in a timely fashion.

Failure to Take an Examination

Written examinations are held at the end of most courses. Every student is required to take the regular examinations at their scheduled dates and times unless excused. If a student fails to take an examination, a grade of *F* will be recorded unless the student has been excused from the examination or has obtained the dean of students' permission to drop the course. No excuse for absence will be granted except

by the dean of students and then only for illness or other emergency. Travel or scheduling conflicts do not constitute an emergency, nor do multiple examinations on the same date or examinations on several consecutive dates. Application for excuse must be made in writing as soon as possible but not later than one month after the date of the examination. A student who has received an excused absence for a graded course will have the temporary grade of *I* (Incomplete) entered on the record and must elect, in writing, one of the following options. First, the student may comply with the instructor's procedure of evaluation (make-up examination, research paper, or other procedure, as determined by the instructor) to be graded on a Credit/No Credit basis (for credit, a minimum grade of *C–* is required for J.D. candidates) before the end of the semester following the excused absence. Second, the student may take the next regularly scheduled examination in the same course, taught by the same or a different instructor, for a letter grade. The examination, however, may not be taken after a student has been excluded for low scholarship, and permission to take an examination before the regularly scheduled date and time will not be granted. If the student fails to complete the elected option within the prescribed period, without an approved absence, the grade of *I* for the course will be changed to a grade of *F*.

Deadlines for Courses Graded by Evaluations Other than In-Class Examinations

As indicated in course descriptions, many courses are graded on the basis of research papers, take-home examinations, appellate briefs, drafting assignments, litigation exercises, negotiation exercises, oral arguments, oral presentations, problem assignments, projects, short papers, simulations, or writing assignments.

To receive a letter grade for a research paper, a student must submit the paper by the date specified by the instructor, or, if the instructor has not specified a due date, by the last day of classes in the semester. For courses taken in the fall semester, the instructor may extend the due date to no later than January 15. For courses taken in the spring semester, the instructor may extend the due date to no later than June 15, unless the student intends to graduate at the end of the semester, in which case the paper must be submitted by the last day of the examination period. In the summer session, the deadline will be determined by the instructor, but will be set no later than the last Friday before fall semester classes begin.

To receive a letter grade for any required assignment other than a research paper, a student must submit the assignment by the date specified by the instructor, or, if the instructor has not specified a due date, by the last day of classes. An instructor may extend the due date to the last day of the examination period in the semester.

Although no letter grade can be awarded for extensions beyond the foregoing deadlines, the instructor may, for sufficient reason, extend a deadline for the submission up to the last day of the examination period of the following semester; further extensions may be granted only in exceptional circumstances and must be approved in writing by the instructor and the dean of students. When the deadline is extended beyond those indicated for receiving a letter grade, the following conditions apply: (1) no student will earn any credit for the course for any purpose until assignments acceptable to the instructor have been submitted; (2) the only grade the student may receive for the course is *CR* (Credit) or *NC* (No Credit). To earn a grade of Credit, a minimum evaluation of *C–* is required for J.D. candidates, unless the assignment is a research paper intended to fulfill the legal writing requirement, in which case a minimum evaluation of *B–* is required. Failure to submit all required assignments within the extended deadline will result in a grade of *F*.

Changes in Program of Study

Juris Doctor degree candidates may make changes in their class schedules during the first six days of classes. After that time, students may add or drop courses only

with the written approval of the instructor, the dean of students, and the director of the Records Office. Under no circumstances may a student drop a course after the last day of classes in any semester.

Attendance

Regular attendance at classes is required and is necessary for successful work. A student who is shown by the instructor to be deficient in class attendance or participation will, after the instructor first attempts to communicate with the student, have a grade of No Credit entered on the record absent an excuse. No excuse for deficient attendance or participation will be granted except by the dean of students and then only for illness or other emergency. A student whose excuse is accepted by the dean of students will be withdrawn administratively from the course.

Registration Holds—Students may not attend classes in any semester or summer session without the express written permission of the dean of students if they have not registered due to a hold on their student account. Failure to adhere to registration and enrollment procedures could result in a violation of the Academic Integrity Code and/or the University's Code of Student Conduct, both of which are reported to bar examiners.

Exclusion and Probation for Low Scholarship

A student whose cumulative average at the end of any semester falls below 1.67 but is above 1.6 will be put on probation. If such a student fails to raise the cumulative average to 1.67 at the end of the next semester, the student will not be permitted to register for any succeeding semester unless he or she petitions for and receives the permission of the Academic Scholarship Committee.

A student whose cumulative average at the end of any semester falls below 1.6 will be excluded from further study unless the student petitions for and receives the permission of the Academic Scholarship Committee.

A student who fails or receives a grade of No Credit more than once over the entire period of law study will be excluded from further study and may not graduate unless the student petitions for and receives the permission of the Academic Scholarship Committee. This rule applies to all students including those in their first year of study.

Students who are registered at the time they receive notice that they will not be permitted to continue their legal studies may receive a full refund of the tuition paid for the semester.

For this purpose the term "semester" includes the summer session.

Procedure for Reinstatement

Any student excluded may petition the Academic Scholarship Committee for reinstatement. The Committee will reinstate the student if he or she can demonstrate (1) that the low grades were due to circumstances beyond his or her control and (2) that he or she has the capacity to pursue the study of law with a definite likelihood of success. The Committee may place conditions on a student's reinstatement; for example, the Committee may require that the student take specific courses, or it may place limits on outside employment.

Continuous Enrollment

Degree candidates are expected to maintain continuous enrollment until all degree requirements are satisfied. By failing to register for one semester or more, the student is dropped from the University's rolls and must be readmitted (see Readmission below). A student who has been granted a leave of absence must maintain continuous enrollment by paying the University registration fee and having the appropriate status noted at the time of registration.

Leave of Absence

After completion of the first year of study, a student may petition the dean of students for a leave of absence from the law school for one semester. A leave of absence will be granted only when the request is sufficiently compelling. A student may petition the Academic Scholarship Committee, through the senior associate dean for academic affairs, to request a leave of absence for more than one semester.

A leave of absence during the first year of study may be granted in compelling circumstances such as a student's medically certified disability requiring absence from classes or a student's hospitalization and medically certified subsequent period of recovery. A student who has been granted a leave of absence must comply with the University's registration procedures for maintaining continuous enrollment. Any student who does not maintain continuous enrollment while on a leave of absence will be required to petition the Academic Scholarship Committee for readmission.

Visiting at Another Law School

A student whose personal circumstances necessitate leaving the Washington, D.C., area may be permitted to study at another ABA-accredited law school and apply the credits earned at that school toward his or her J.D. degree at the Law School. A student must petition the Academic Scholarship Committee and demonstrate that compelling personal circumstances warrant study at another institution. The Committee may grant one-semester visits on this basis. Permission to visit for two semesters is granted rarely, and only in the most extraordinary circumstances. In no event will the Committee allow more than 28 credit hours of study taken at another school to be counted toward the degree here. The courses to be taken at another law school must be approved in advance by the dean of students, and a student must earn a grade of *C*− or better (under the grading system of the other law school) to transfer the credit hours with a grade of Credit to the Law School. Students who register at another law school must provide the director of the Records Office with an official transcript of their work there promptly on its completion.

Readmission

A student who was previously registered but did not attend during the most recent semester (summer session excluded), and who has not been granted a leave of absence, must apply to the Academic Scholarship Committee for readmission. A readmitted student is required to satisfy the curriculum requirements existing at the time of readmission.

Credit for Courses Taken in Other GW Schools

After the first year and with the approval of the dean of students, students may take a maximum of 6 credit hours of appropriate graduate-level courses in other schools of the University; a grade of at least *B*− must be received to obtain credit for such courses; and the grade does not count in computing the cumulative average. Grades of Credit or No Credit resulting from courses taken in other schools will count toward the total of 17 hours allowed under the Credit/No Credit option. Law students receive 1 credit hour for each 700 minutes of scheduled class time in a semester; therefore, a law student may in some cases earn only 2 credits for a course offered by another school of the University for 3 credits.

Summer School Credit from Other Law Schools

Unless granted permission to attend another law school as a visiting student (see Visiting at Another Law School), or participating in a Law School-sponsored exchange program, Juris Doctor students may only earn credits from other law schools during the summer. Students may earn no more than a total of 6 credit

hours from summer programs at other law schools toward their degree. Students planning to attend summer sessions at other law schools and intending to use the credit toward their Juris Doctor program at the Law School must first have the courses they wish to take approved by the dean of students. Approval is usually granted to attend summer study abroad programs sponsored by ABA-accredited law schools, but the following prohibitions apply to courses offered on the campus of ABA-accredited law schools during their summer sessions: Students may take courses in other law schools' summer sessions for credit toward the degree only if the same course is not being offered at the Law School at any time during the next academic year for full-time students, or in the evening during the next academic year for part-time students. Upon a showing of good cause, a waiver of this policy may be granted by the dean of students.

A student must earn a grade of *C*− or better (under the grading system of the other law school) to transfer the credit hours with a grade of Credit to the Law School; and the grade does not count in computing the cumulative average. Grades of Credit or No Credit resulting from courses taken at other law schools during the summer will count toward the total of 17 hours allowed under the Credit/No Credit option. Credit will not be recognized in excess of that which can be obtained in a similar period at the Law School. Students who register at another law school must provide the director of the Records Office with an official transcript of their work there promptly on its completion.

Joint Juris Doctor–Master's Degree Programs

The Law School offers joint degree programs with four other schools of the University. The J.D.–M.P.H. is offered with the School of Public Health and Health Services. The J.D.–M.B.A. is offered with the School of Business. The J.D.–M.A. is offered with the Elliott School of International Affairs. With Columbian College of Arts and Sciences the J.D.–M.P.A., J.D.–M.P.P., and J.D.–M.A. (in the field of history with a concentration in U.S. legal history; in the field of women's studies; and in the field of public policy with a concentration in women's studies) are offered.

Students must be admitted both to the Law School and, separately, to the school that confers the master's degree. Each school must separately approve a student's application to pursue a joint degree program. The joint degrees must be conferred simultaneously and only after all requirements for both degrees have been met.

Once a student has been admitted to both schools as a joint degree candidate, the first year of study must be devoted exclusively to the prescribed law curriculum. After the first year of law studies, the Law School will allow 12 credit hours of course work completed in the master's program to count toward completion of the 84 credit hours required for the law degree. The grade of *CR* (Credit) or *NC* (No Credit) will be recorded for such courses; a student must receive a grade of at least *B*− to receive a grade of Credit. Grades of Credit and No Credit resulting from courses taken in other GW schools will count toward the total of 17 hours allowed under the Credit/No Credit option. Law students receive 1 credit hour for each 700 minutes of scheduled class time in a semester; therefore, a law student may in some cases earn only 2 credits for a course offered by another school of the University for 3 credits.

A number of other regulations govern the joint degree programs. Students interested in entering one of these programs should consult with the appropriate admissions offices and the Law School Dean of Students Office.

Graduate Programs

The Law School offers advanced degree programs leading to the Master of Laws and Doctor of Juridical Science degrees for U.S. and non-U.S. law school graduates. Both the LL.M. and S.J.D. programs offer an opportunity for attorneys to gain a more in-depth understanding of the law while engaging in scholarly research.

The Master of Laws Degree

The Master of Laws candidate may follow a program of general study and design an individual program or may concentrate in one of the specialized fields listed below. Graduates who complete their work in one of these areas may have the field of specialization noted on their diplomas.

Environmental Law
Government Procurement Law
Government Procurement and Environmental Law
Intellectual Property Law
International and Comparative Law
International Environmental Law
Litigation and Dispute Resolution

Entrance Requirements

For applicants with a U.S. law degree, a Juris Doctor or equivalent degree is required from a law school that is a member of the Association of American Law Schools or is approved by the American Bar Association. The applicant must have demonstrated a high degree of academic excellence in earning the first law degree.

Non-U.S. law school graduates must have completed a law degree with high academic standing from a recognized university. Non-U.S. law school graduates may also need to meet the minimum language test requirement (see below).

Advanced standing is not granted for credit earned while a candidate for the first law degree or for credit earned at any time before the student was a degree candidate in the LL.M. program at the Law School. An exception may be made in the case of students who earn credit through the Oxford–GW International Human Rights Law Program and who subsequently are admitted to LL.M. degree candidacy in the area of International and Comparative Law.

Admission

Application forms are available from and should be returned to Graduate Programs Office, The George Washington University Law School, Washington, D.C. 20052.

U.S. Law School Graduates—U.S. law school graduates are usually admitted for the fall semester. Spring admission may be granted at the discretion of the program director. Applications are due by June 1 for the fall semester and November 1 for the spring semester.

Non-U.S. Law School Graduates—Non-U.S. law school graduates are admitted for the fall semester only. Applications are due by March 15.

Test of English as a Foreign Language (TOEFL)

Students from countries where English is not an official language are required to take the Test of English as a Foreign Language and attain a score in the 600-point range (paper-based) or 250-point range (computer-based) to be considered for admission at the Law School. This is a mandatory requirement. Applicants are responsible for making arrangements for taking the test and should address inquiries to TOEFL, Educational Testing Service, P.O. Box 6154, Princeton, New Jersey 08541, U.S.A. The completed application form should be returned to the Testing Service at Princeton well in advance of the beginning of the semester for

which the applicant seeks admission. The test fee, which should be remitted with the application, entitles the student to have the test score sent to three institutions. Registration for the Test of English as a Foreign Language does not constitute application for admission to The George Washington University.

The Bulletin of Information, obtainable without charge, contains a description of the test as well as rules regarding application, fees, reports, and the conduct of the test; lists of examination centers; examination dates; and an application blank. On the application for the test, the student should specify that the scores be sent to the Law School's Graduate Programs Office.

Non-Degree Students

A limited number of law school graduates may be admitted in non-degree status to take up to 6 hours of credit. Applicants should contact the Graduate Programs Office for application materials and instructions. Entrance requirements for non-degree students are the same as those for degree candidates. (See Admission and Entrance Requirements, above). Non-degree students who subsequently apply for and are granted admission to one of the graduate programs as a degree candidate may have the credits earned at the Law School applied toward degree requirements; however, admission as a degree candidate is not guaranteed. Enrollment in individual courses as a non-degree student will depend on space availability.

Degree Requirements

U.S. Law School Graduates

In order to earn the Master of Laws degree, U.S. law school graduates must fulfill the following requirements: completion of 24 credit hours, including the required curriculum in the specialized programs (see Curriculum, below); attendance for a residence period of a minimum of two consecutive semesters; achievement of a cumulative grade-point average of 2.67 at the time all requirements are met; and completion and acceptance of a thesis (except for candidates for the degree in Litigation and Dispute Resolution) unless this requirement has been waived (see Thesis Waiver, below).

U.S. students who are full time (those enrolled for 9 or more credit hours per semester) are expected to complete all degree requirements within one calendar year of matriculation; those who are part time (enrolled for 8 or fewer credit hours per semester) are expected to complete all degree requirements within two calendar years of matriculation. Determination of the applicable time limit will be made on the basis of the number of credit hours for which the student enrolls in the first semester of his or her degree program. Extensions of these time limits for completion of the thesis requirement may be granted under appropriate circumstances (see Thesis Requirement, below).

Non-U.S. Law School Graduates

In order to earn the Master of Laws degree, all non-U.S. law school graduates must fulfill the following requirements: completion of 24 credit hours, including the required curriculum in the specialized programs (see Curriculum, below); attendance for a residence period of a minimum of two consecutive semesters; achievement of a cumulative grade-point average of 2.00 at the time all requirements are met (2.67 for non-U.S. attorneys who previously earned an LL.M. from a U.S. law school); completion and acceptance of a thesis unless this requirement has been waived (see Thesis Requirement, below); and completion of Law 694, *Fundamental Issues in U.S. Law.*

Non-U.S. law school graduates are expected to complete all degree requirements in one academic year. An extension for one semester may be granted by the program director in exceptional circumstances.

Thesis Requirement

The thesis is expected to be a scholarly paper of the same quality and length as a law review article. Full-time students take Law 690–91, *Thesis,* during the first and second semesters of their program; part-time students, during their third and fourth semesters. With the approval of the program director or thesis adviser, an extension of up to one calendar year may be granted for completion of the thesis; continuous enrollment must be maintained during the period of the extension. Those who, due to extraordinary circumstances, require an extension beyond one calendar year must receive approval from the program director and thesis adviser; continuous enrollment must be maintained.

Thesis Waiver

U.S. Law School Graduates

LL.M. candidates who are graduates of U.S. law schools may request in writing a waiver of the thesis requirement. A student in the General LL.M. program must submit the request to the senior associate dean for academic affairs. A candidate for the degree in a specialized field must submit the request to the program director. Candidates who are granted a waiver must complete the minimum required credits of course work graded on the basis of a research paper as outlined for their field under Curriculum, below, with a grade of *B+* or better. Program directors may impose other conditions for the thesis waiver at their discretion.

Non-U.S. Law School Graduates

LL.M. candidates who are graduates of non-U.S. law schools may request in writing a waiver of the thesis requirement. A student in the General LL.M. program must submit the request to the director of the International and Comparative Law Program. A student in a specialized field must submit the request to the program director. All requests for a thesis waiver must be submitted no later than the beginning of the final semester or summer session before the student's graduation. Candidates who are granted a waiver must complete the minimum required credits of course work graded on the basis of a research paper as outlined for their field under Curriculum, below.

Curriculum

All candidates for the LL.M. complete 24 credit hours, including 4 hours of thesis for those students who are subject to the thesis requirement (see above). Those working toward the General LL.M. should consult with the senior associate dean for academic affairs and the designated thesis adviser in order to design a comprehensive program of study; students may choose to concentrate their studies in one or more areas, such as constitutional law, labor law, corporate law, and health care law. Those working toward a specialized degree must complete the minimum required number of hours in courses listed below for that program. Related courses are recommended for the remaining course work. Specialized degree candidates must have their programs of study approved by the program director.

Environmental Law Program

Director A. Reitze; *Faculty Advisers* J. Grodsky, S. Murphy

The Environmental Law Program offers programs of study in three specialized fields—Environmental Law, Government Procurement and Environmental Law, and International Environmental Law. Course requirements for each field of specialization are given below:

LL.M. in Environmental Law—
Thesis (690–91) and a minimum of 12 credits from the following courses are required; if the thesis is waived, an additional 4 credits in courses in the field graded on the basis of a research paper are required:

Air Pollution Control (432)
Environmental Law Enforcement (433)
Water Pollution Control (434)
Trade and Sustainable Development (435)
Water Resources Law (436)
Coastal, Navigation, and Wetlands Resource Law (437)
Energy Law and Regulation (438)
Natural Resources Law (440)
Regulation and Management of Ecosystems (441)
Control of Solid and Hazardous Wastes (RCRA & CERCLA) (442)
Toxic Tort Litigation (449)
Federal Facilities Environmental Law Issues (450)
Environmental Issues in Business Transactions (452)
International Environmental Law (454)
Environmental Planning (456)
Sustainable Regional Growth Seminar (457)
Environmental Negotiations (458)
Environmental Crimes (464)
Environmental Crimes Project (465)
Environmental Law Seminar (466)
Graduate Environmental Placement (468)
Government Contracts and Environmental Law Seminar (507)

LL.M. in Government Procurement and Environmental Law—
Thesis (690–91) and the following courses are required; if the thesis is waived, an additional 4 credits in courses in the field graded on the basis of a research paper are required:

Air Pollution Control (432)
Environmental Law Enforcement (433)
Water Pollution Control (434)
Control of Solid and Hazardous Wastes (RCRA & CERCLA) (442)
Formation of Government Contracts (502)
Performance of Government Contracts (503)
Government Contracts Cost and Pricing (506) *or* Government Contracts and Environmental Law Seminar (507)

LL.M. in International Environmental Law—
Thesis (690–91) and the following courses are required; if the thesis is waived, an additional 4 credits in courses in the field graded on the basis of a research paper are required:

Air Pollution Control (432)
Water Pollution Control (434)
Trade and Sustainable Development (435)
Control of Solid and Hazardous Wastes (RCRA & CERCLA) (442)
International Environmental Law (454)
International Law (520)
International Business Transactions (522) *or* International Organizations (530)

Courses Related to Environmental Law

Complex Litigation (236)
Admiralty (293)
Land Use Law (332)
Products Liability (354)
Administrative Law (400)
Regulated Industries (406)
Food and Drug Law (408)
Legislative Analysis and Drafting (418)
Animal Law and Wildlife Protection Seminar (424)
Formation of Government Contracts (502)
Performance of Government Contracts (503)
International Trade Law (526)
Law of the Sea (550)

Quantitative Analysis for Lawyers (604)
Genetics and the Law (616)
Mediation and Alternative Dispute Resolution (676)
International Dispute Resolution (682)

Government Procurement Law Program

Directors S. Schooner, J. Schwartz; *Faculty Advisers* W. Kovacic, F. Lees, C. Yukins

LL.M. in Government Procurement Law—
Thesis (690–91) and a minimum of 10 credits from the following courses are required; if the thesis is waived, an additional 4 credits in courses in the field graded on the basis of a research paper are required.

Formation of Government Contracts (502)
Performance of Government Contracts (503)
Government Contracts Cost and Pricing (506)
Government Contracts and Environmental Law Seminar (507)
Comparative Public Procurement (508)
Government Contracts Seminar (509)
Graduate Government Contracts Placement (510)

Courses Related to Government Procurement Law

Federal Courts (232)
Labor Law (266)
Business Planning (296)
Corporate Taxation (302)
Employment Discrimination Law (390)
Administrative Law (400)
Antitrust Law (402)
Advanced Antitrust Law Seminar (403)
Health Care Law (410)
Legislation (416)
Legislative Analysis and Drafting (418)
Local Government Law (422)
Public Law Seminar (426)
Environmental Law (430)
Patent Law (471)
International Business Transactions (522)
International Commercial Law (524)
Law and Economics (598)
Law and Accounting (602)
Quantitative Analysis for Lawyers (604)
Government Lawyering (671)
Mediation and Alternative Dispute Resolution (676)
Negotiation and Conflict Management Systems Design (681)

Intellectual Property Law Program

Directors M. Adelman, R. Brauneis; *Faculty Advisers* J. Duffy, D. Nunziato, R. Schechter

LL.M. in Intellectual Property Law—
Thesis (690–91) and a minimum of 10 credits is required from the following courses; if the thesis is waived, an additional 4 credits in courses in the field, including 2 credits graded on the basis of a research paper, are required:

Patent Law (471)
Copyright Law (472)
International Copyright Law (473)
Trademark Law and Unfair Competition (474)
Patent Strategies and Practice (476)
The Federal Circuit (477)
Licensing of Intellectual Property Rights (478)
Intellectual Assets Management (479)
Chemical and Biotech Patent Law (480)
Patent Enforcement (482)
Patent Appellate Practice (483)
Computer Law (484)
Law in Cyberspace (485)
Art, Cultural Property, and the Law (488)
International and Comparative Patent Law (490)
Intellectual Property Antitrust Seminar (494)
Intellectual Property Law Seminar (496)

Courses Related to Intellectual Property Law

E-Commerce (283)
Sports Law (295)
Law of Privacy (398)
Antitrust Law (402)
Advanced Antitrust Law Seminar (403)
Communications Law (412)
Broadcast and Cable Regulation (413)
Telecommunications Law (414)
Entertainment Law (475)
Information Privacy Law (486)
Formation of Government Contracts (502)
International E-Commerce Seminar (525)
Genetics and the Law (616)
Law and Medicine (617)

International and Comparative Law Program

Director S. Karamanian; *Faculty Advisers* S. Charnovitz, D. Clarke, K. Brown, S. Murphy, D. Shelton, J.A. Spanogle, R. Steinhardt

LL.M. in International and Comparative Law—
Thesis (690–91) and a minimum of 12 credits from the following courses are required; if the thesis is waived, the 12 credits must include at least 2 credits graded on the basis of a research paper.

International Taxation I (312)
International Taxation II (313)
Counterterrorism Law (383)
U.S. Foreign Relations Law (385)
National Security Law (386)
Trade and Sustainable Development (435)
International Environmental Law (454)
International Copyright Law (473)
International Law (520)
International Business Transactions (522)
International Commercial Law (524)
International E-Commerce Seminar (525)
International Trade Law (526)
Advanced International Trade Law (527)
International Litigation (528)
International Labor Standards and the Global Economy (529)
International Organizations (530)
International Judicial Assistance (531)
Comparative Law (532)
Transnational Family Law (533)
Law of the European Union (534)
Islamic Law (535)
Law of Japan (536)
Traditional Jewish Civil Law (537)
Immigration Law I (538)
Immigration Law II (539)
Refugee and Asylum Law (540)
Introduction to Chinese and Japanese Law (541)
International Banking (542)
Law of the People's Republic of China (543)
Foreign Direct Investment (544)
International Project Finance (545)
International Law of Human Rights (546)
Regional Protection of Human Rights (547)
Chinese Business Law (549)
Law of the Sea (550)
International Law of Territory and Territorial Disputes (551)
Law of War (552)
U.S. Export Control Law and Regulation (553)
International Criminal Law (554)
International Arbitration (556)
International Negotiations (558)
Nuclear Nonproliferation Law and Practice (560)
Trade Remedy Law (563)
Law of Race and Slavery (596)
Public International Law Seminar (562)
International Business Transactions Seminar (564)
Comparative Law Seminar (565)
Human Rights Advocacy Seminar (567)
Human Rights Lawyering (568)
International Human Rights Clinic (633)

GW–Oxford International Human Rights Law Program Courses

The following courses are offered as part of the GW–Oxford International Human Rights Law Program, which is held in summer at the University of Oxford. Credit earned in these courses may be applied toward LL.M. program requirements in International and Comparative Law.

Human Rights and the International Criminal Process (820)
Comparative Human Rights Institutions (822)
Human Rights and Refugee Law (824)
Human Rights in the Marketplace (826)
International Rights of Women (828)
Human Rights Advocacy and Dissemination (830)
Rights of Minorities, Groups, and Indigenous Populations (832)
Humanitarian Law and Populations at Risk (834)
Human Rights and Military Responses to Terrorism (836)
Protection of Human Rights in Conflict and Post-Conflict Situations (838)
Advanced Seminar in Human Rights (839)

Courses Related to International and Comparative Law

Conflict of Laws (234)
Admiralty (293)
International and Comparative Patent Law (490)
Law in Cyberspace (485)
Art, Cultural Property, and the Law (488)
Comparative Public Procurement (508)
Law and Anthropology (612)
International Dispute Resolution (682)

Litigation and Dispute Resolution Program

Director S. Saltzburg; *Associate Director* A. Robinson

LL.M. in Litigation and Dispute Resolution—
The College of Trial Advocacy (683) and 21 credits from the following courses are required:

Advanced Trial Advocacy (675)
Mediation and Alternative Dispute Resolution (676)
Pre-Trial Practice in Civil Cases (677)
Ethics in Adjudication and Settlement (678)
Advanced Evidence (679)
The American Jury (680)
Negotiation and Conflict Management Systems Design (681)
International Dispute Resolution (682)
Pre-Trial Practice in Criminal Cases (684)

Joint Master of Laws–Master's Degree Programs

The Law School offers joint degree programs with two other schools of the University for LL.M. candidates. The LL.M.–M.P.H. is offered with the School of Public Health and Health Services for students who are pursuing a General LL.M. or the LL.M. in Environmental Law. The LL.M.–M.A. (in the field of history with a concentration in U.S. legal history; in the field of women's studies; or in the field of public policy with a concentration in women's studies) is offered with Columbian College of Arts and Sciences for students who are pursuing the LL.M. in International and Comparative Law. Students must be admitted both to the Law School and, separately, to the school that confers the other master's degree. Each school must separately approve a student's application to pursue a joint degree program. The joint degrees must be conferred simultaneously and only after all requirements for both degrees have been met.

The Law School will allow 6 credit hours of work completed in the other master's program to count toward completion of the 24 credit hours required for the

LL.M. degree. The grade of *CR* (Credit) or *NC* (No Credit) will be recorded for such courses; a student must receive a grade of at least *B*− to receive a grade of Credit. Law students receive 1 credit hour for each 700 minutes of scheduled class time in a semester; therefore, a law student may in some cases earn only 2 credits for a course offered by another school of the University for 3 credits.

A number of other regulations govern the joint degree programs. Students interested in entering one of these programs should consult with the appropriate admissions offices.

Academic Regulations

Academic Evaluation

Grades

Letter grades are given with numerical equivalents as follows.

A+ = 4.33	B+ = 3.33	C+ = 2.33	D = 1.0
A = 4.0	B = 3.0	C = 2.0	F = 0
A− = 3.66	B− = 2.66	C− = 1.66	

Graduate students may not elect to take graded courses on a Credit/No Credit basis. No credit is given for grades below *C*− for U.S. law school graduates in the program and for grades below *D* for non-U.S. law school graduates. A student who has been excused from taking a regularly scheduled examination or has been granted an extension of the deadline for a research paper is given the grade of *I*, Incomplete. (See Failure to Take an Examination, and Deadlines for Courses Graded on the Basis of Methods of Evaluation Other than In-Class Examinations, below.) The cumulative average of a student includes all grades in all courses taken while a candidate for a given degree.

No grade may be changed by an instructor after it has been posted or disclosed to a student unless there has been an arithmetic or administrative error that has been certified in writing by the instructor. A student has the right of faculty peer review of complaints of "capricious or prejudiced academic evaluation" under the regulations outlined in *The George Washington University Guide to Students' Rights and Responsibilities.* To initiate such a review, the student must submit a letter and supporting documentation to the senior associate dean for academic affairs by the last day of classes of the semester following the semester or summer session in which the grade for an examination, paper, or other work product was awarded.

Method of Evaluation

The method of evaluation is indicated at the end of each course description in this Bulletin, and a student's grade in the course will be determined in large part on that basis. In most courses, a final examination is held during the examination period. These courses are marked "examination." Additional written work requirements are indicated by notations such as "drafting assignments" or "problem assignments." A small number of courses are marked "take-home examination," indicating that the instructor will determine the method by which the examination is administered outside of the classroom.

Courses that require the preparation of a major research paper in lieu of an examination are marked "research paper." Some courses are marked "examination or research paper with permission of the instructor." In such cases an examination will be scheduled but the instructor may grant permission for a number of students to write a research paper in lieu of the examination.

Skills courses are usually graded on the basis of simulation, role-playing, and/or some form of written assignment and may be marked, for example, "drafting assignments" or "simulation and paper."

Participation—Once a student has been evaluated in a course using the method indicated in the course description, the instructor may raise or lower the student's

grade on the basis of class participation. A student's grade may be raised or lowered by only one grade step for class participation, e.g., from *B* to *B+*, or *B* to *B−*.

Honors

The degree of Master of Laws "With Highest Honors" is awarded to those students who obtain a minimum cumulative average of 3.67.

Failure to Take an Examination

Written examinations are held at the end of most courses. Every student is required to take the regular examinations at their regular dates and times unless excused. If a student fails to take an examination, a grade of *F* will be recorded unless the student has been excused from the examination or has obtained the dean of students' permission to drop the course. No excuse for absence will be granted except by the dean of students and then only for illness or other emergency. Travel or scheduling conflicts do not constitute an emergency, nor do multiple examinations on the same date or examinations on several consecutive dates. Application for excuse must be made in writing as soon as possible but not later than one month after the date of the examination. A student who has received an excused absence for a graded course will have the temporary grade of *I* (Incomplete) entered on the record and must elect, in writing, one of the following options. First, the student may comply with the instructor's procedure of evaluation (make-up examination, research paper, or other procedure, as determined by the instructor) to be graded on a Credit/No Credit basis (for credit, a minimum grade of *C−* is required for LL.M. candidates) before the end of the semester following the excused absence. Second, the student may take the next regularly scheduled examination in the same course, taught by the same or a different instructor, for a letter grade. The examination, however, may not be taken after a student has been excluded for low scholarship, and permission to take an examination before the regularly scheduled date and time will not be granted. If the student fails to complete the elected option within the prescribed period, without an approved absence, the grade of *I* for the course will be changed to a grade of *F*.

Deadlines for Courses Graded by Evaluations Other than In-Class Examinations

As indicated in course descriptions, many courses are graded on the basis of research papers, take-home examinations, appellate briefs, drafting assignments, litigation exercises, negotiation exercises, oral arguments, oral presentations, problem assignments, projects, short papers, simulations, or writing assignments.

To receive a letter grade for a research paper, a student must submit the paper by the date specified by the instructor, or, if the instructor has not specified a due date, by the last day of classes in the semester. For courses taken in the fall semester, the instructor may extend the due date to no later than January 15. For courses taken in the spring semester, the instructor may extend the due date to no later than June 15, unless the student intends to graduate at the end of the semester, in which case the paper must be submitted by the last day of the examination period. In the summer session, the deadline will be determined by the instructor, but will be set no later than the last Friday before fall semester classes begin.

To receive a letter grade for any required assignment other than a research paper, a student must submit the assignment by the date specified by the instructor, or, if the instructor has not specified a due date, by the last day of classes. An instructor may extend the due date to the last day of the examination period in the semester.

Although no letter grade can be awarded for extensions beyond the foregoing deadlines, the instructor may, for sufficient reason, extend a deadline for the submission up to the last day of the examination period of the following semester; further extensions may be granted only in exceptional circumstances and must be

approved in writing by the instructor and the dean of students. When the deadline is extended beyond those indicated for receiving a letter grade, the following conditions apply: (1) no student will earn any credit for the course for any purpose until assignments acceptable to the instructor have been submitted; (2) the only grade the student may receive for the course is *CR* (Credit) or *NC* (No Credit). To earn a grade of Credit, a minimum evaluation of *C–* is required for LL.M. candidates. Failure to submit all required assignments within the extended deadline will result in a grade of *F*.

Changes in Program of Study

Master of Laws candidates may make changes in their class schedules during the first six days of classes. After that time, students may add or drop courses only with the written approval of the instructor, the dean of students, and the director of the Records Office. Under no circumstances may a student drop a course after the last day of classes in any semester.

Credit for Courses Taken in Other GW Schools

Master of Laws candidates are permitted to take graduate courses related to their fields of interest in other schools of this University with the permission of their program director. A maximum of 6 credit hours will be credited toward the degree for such courses. The grade of *CR* (Credit) or *NC* (No Credit) will be recorded for such courses; a student must earn a grade of at least *B–* to receive a grade of Credit. Law students receive 1 credit hour for each 700 minutes of scheduled class time in a semester; therefore, a law student may in some cases earn only 2 credits for a course offered by another school of the University for 3 credits.

Consortium of Universities of the Washington Metropolitan Area, Inc.

A candidate for the Master of Laws degree may take graduate courses at Georgetown University Law Center through the Consortium of Universities of the Washington Metropolitan Area. A maximum of 6 credit hours of such courses may be credited toward the master's degree. Permission to take Consortium courses must be granted by the Law School's dean of students and the registrar of Georgetown University Law Center. The grade of *CR* (Credit) or *NC* (No Credit) will be recorded for such courses. To receive the grade of *CR* a student must attain a grade of *C–* or higher.

Readmission

A student who fails to register for one or more semesters will be required to apply for readmission in order to continue in the degree program. Application for readmission should be made to the relevant program director. Readmitted students will not receive academic credit for course work completed more than five years prior to the date of the readmission request. Petitions for exceptions to this policy should be addressed to the relevant program director and the senior associate dean for academic affairs and will be granted only in exceptional circumstances.

Attendance

Regular attendance at classes is required and is necessary for successful work. A student who is shown by the instructor to be deficient in class attendance or participation will, after the instructor first attempts to communicate with the student, have a grade of No Credit entered on the record absent an excuse. No excuse for deficient attendance or participation will be granted except by the dean of students and then only for illness or other emergency. A student whose excuse is accepted by the dean of students will be withdrawn administratively from the course.

Because the courses in the Litigation and Dispute Resolution degree program are evaluated solely on the basis of the student's performance in class, any student enrolled in Law 675, 676, 677, 678, 679, 680, 681, 682, 683, or 684 who misses more than three class meetings will receive a grade of *NC* (No Credit) unless the student can demonstrate to the satisfaction of the program director that the absences were for good reason and beyond the student's control. In such a case, the student will be withdrawn administratively from the course. The student may repeat the course at its next offering by registering and paying the tuition. However, the grade of *NC* will remain on the record.

The Doctor of Juridical Science Degree

Programs leading to the degree of Doctor of Juridical Science offer a very small number of unusually talented students, who have already earned the Master of Laws degree, the opportunity to concentrate on research and writing in a specific area of interest.

Entrance Requirements

U.S. Law School Graduates

For S.J.D. applicants who earned their first law degree from a U.S. law school, the following requirements pertain. Applicants must hold a B.A. or equivalent degree from a regionally accredited college or university and a J.D. and an LL.M. or equivalent degrees, both earned with excellent records, from law schools that are members of the AALS or approved by the ABA. (The requirement for an LL.M. may be waived in exceptional circumstances.) Applicants must submit copies of their master's thesis or one or more papers or articles they have written. Applicants must include a research proposal and dissertation topic approved by a full-time member of the Law School faculty who has agreed to serve as the faculty adviser if the applicant is admitted.

Non-U.S. Law School Graduates

For S.J.D. applicants who earned their first law degree at a non-U.S. law school, the following entrance requirements pertain. Applicants must have graduated with an excellent academic record from a non-U.S. law school known for high academic standards; such a determination will be made by the Graduate Programs Office or by a qualified faculty member. As outlined above for U.S. law school graduates, additional requirements include an LL.M. (which may be waived in exceptional circumstances), copies of the master's thesis or one or more papers or articles written by the applicant, and a research proposal and dissertation topic approved by a full-time member of the Law School faculty who has agreed to serve as the faculty adviser if the applicant is admitted. Consideration for admission requires proficiency in the English language, both oral and written, as determined by the Graduate Programs Office or by a faculty member designated by the dean.

Degree Requirements

Candidates for the Doctor of Juridical Science degree must complete the following requirements in order to be awarded the degree: a residence period of not less than one academic year; a course of study and research, designated by the dissertation committee, of no less than 8 credit hours; and completion and acceptance of a dissertation (see below).

The course work for the S.J.D. degree will normally be completed during the first two years of study. During this period, tuition is paid in four equal payments and no limit is placed on the number of credit hours for which a degree candidate

may enroll with his or her adviser's approval. After the first two years from the date of matriculation, tuition will be charged by the credit hour for any additional courses taken by the degree candidate, either for credit or as an auditor.

The Dissertation

The dissertation must be submitted no later than three years from the date of admission to candidacy for the S.J.D. degree. The applicant who proposes to write on a comparative law topic must have a reading knowledge of the language in which the relevant materials are to be found. When the dissertation is submitted, the consultative committee will set the date for oral examination. This examination is conducted by the consultative committee and such other members of the faculty and qualified experts as are selected by the appropriate program director in consultation with the dean.

No later than one month before the expected date of graduation, the candidate must submit to the associate dean for academic affairs two complete copies of the dissertation and two copies of an abstract of the dissertation.

To be acceptable, the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information can be obtained from the associate dean for academic affairs. Accepted dissertations become the property of the University and are placed in the University's Gelman Library and the Jacob Burns Law Library, where duplicate copies are bound and made available for circulation.

Summer and Exchange Programs

On-Campus Summer Session

One session is offered on campus in the summer. No beginning students are admitted to the Juris Doctor degree program in the summer session. Students who attend the summer session receive fractional residence credit.

GW–Oxford Summer Program in International Human Rights Law

The Program in International Human Rights Law is offered jointly by the University of Oxford and The George Washington University Law School and is held in Oxford in July. It is intended to prepare students to contribute to the improvement of human rights conditions in their homelands and around the world. During the program's four-week session, an internationally recognized faculty offers courses on the philosophy, history, doctrine, and practice of international human rights law. The program emphasizes advocacy and dissemination skills, as well as formal knowledge of human rights law, the means of its enforcement, and its status in a contentious world. Professor Ralph G. Steinhardt of the Law School faculty is co-director of the program. Applications are accepted from law students, graduate students in related fields, lawyers, and other professionals with a demonstrated interest in human rights. For more information, contact Summer Sessions, The George Washington University, Washington, D.C. 20052; telephone (202)994-6360; fax (202)994-9133; email sumprogs@gwu.edu.

GW–Augsburg Student Exchange Program

A limited number of J.D. degree candidates may attend the University of Augsburg School of Law in Germany to participate in the program in European and international economic law held in June and July. GW J.D. students who have completed their first year of study are eligible to participate in this program. Credit earned in this program counts toward the total number of credit hours required for the J.D. degree. GW students receive the grade of Credit or No Credit in courses taken under this program. For more information, contact the Graduate Programs Office, International Students Division, telephone (202)994-7242, email igpo@law.gwu.edu.

Munich Intellectual Property Summer Program

This summer program is held in July at the Munich Intellectual Property Law Center in Germany. The program offers the opportunity to study current intellectual property issues with a focus on international law in the city known as Europe's intellectual property capital. Leading academics in the field offer courses in topics such as international patent law, copyright law, and Internet law. Special lectures and visits to institutions such as the European Patent Office are part of the program. Professor Robert Brauneis of the Law School faculty is the director of the program. Applications are accepted from students enrolled in U.S. and non-U.S. law schools. For more information, contact the Intellectual Property Law Program, The George Washington University Law School, 700 20th Street, N.W., Washington, D.C. 20052; telephone (202)994-0263; email iplaw@law.gwu.edu.

North American Consortium on Legal Education

The Law School is a founding member of the North American Consortium on Legal Education, formed to promote increased understanding within North American countries of neighboring legal systems through cross-border research, curriculum development, and student exchange. U.S. member schools also include the University of Arizona James E. Rogers College of Law and the University of Houston

Law Center. Juris Doctor students may apply to participate in NACLE as a visiting student in their second or third year for one semester at a Canadian or Mexican member institution: Dalhousie University Faculty of Law in Halifax; McGill University Faculty of Law in Montreal; the University of Ottawa Faculty of Law; Instituto Tecnológico de Estudios Superiores de Monterrey Escuela de Derecho in Monterrey; and Universidad Panamericana Facultad de Derecho in Mexico City. Credit earned as a visiting student in the program counts toward the total credit hours required for the J.D. degree. GW students receive the grade of Credit or No Credit in courses taken under this program. For more information contact the Graduate Programs Office, International Students Division, telephone (202)994-7242, email igpo@law.gwu.edu.

Fees and Financial Regulations

The following fees and financial regulations were adopted for the 2005 summer session and the 2005–06 academic year.

Tuition and Fees

Full-time J.D. candidates, for the academic year	$34,500
Part-time J.D. candidates and LL.M. candidates, per credit hour	1,213
Continuing Legal Education students, per credit hour	1,213
S.J.D. candidates, full program, including the final examination	34,500
Special Fees and Deposits (Nonrefundable)	
Application fee	80
Tuition deposit fee charged each student admitted to J.D. degree candidacy (payable in two installments—$200 by a date specified in the letter of admission; $800 by mid-June)	1,000
Tuition deposit fee charged each student admitted to LL.M. degree candidacy (payable on the date specified in the letter of admission)	500
Late registration beginning the first week of the semester	80
Registration for continuous enrollment or leave of absence	35
Fee for binding master's thesis or S.J.D. dissertation	30
Late-payment fee (see Payment of Fees, below)	75
Replacement of lost or stolen picture identification card	25
Returned check fee, charged a student whose check is returned because of insufficient funds or for any other reason	35
Transcript fee	5
Replacement of diploma fee	50

Registration on campus in the University entitles each student to the following privileges: the services of the Career Center; the use of the University libraries; gymnasium privileges; and admission to all athletic contests, unless otherwise specified. These privileges terminate and a student is no longer in residence upon withdrawal or dismissal from the University.

Voluntary Library Fee—The Registration Schedule and Invoice includes a voluntary gift for the University libraries. Check the box labeled "Library Gift Decline" and omit the amount from your payment if you do not wish to include the library gift in your reimbursement to the University.

Payment of Fees

A student who registers for classes in any semester or session incurs a financial obligation to the University. Payment of tuition and fees is due upon receipt of the Schedule and Invoice or at the time of registration. Except for students on the monthly payment plan, tuition is to be paid in full by the first day of the semester or upon registration if registration is after the first day of the semester. The University reserves the right to revoke the registration, effective to the beginning of the semester, of any student who fails to make full payment. Students whose registrations have been revoked or canceled for failure to make timely payments are not permitted to attend class and may not occupy University housing. Changes to registration that affect charges to the student's account must be recorded through

* The tuition fee is to be paid at the rate of $8,625 per semester for four successive semesters, exclusive of the summer term or terms. If the faculty should approve an extension of time, the student must maintain continuous enrollment. After the first two years from the date of matriculation, tuition will be charged by the credit hour for any additional courses taken by the degree candidate, either for credit or as an auditor.

the Office of the Registrar. In addition to payment of tuition and fees, the University requires that a student confirm his or her registration. Students whose registrations are not confirmed by the third week of the semester may be canceled from all courses. Receipt of the tear-off portion of the Schedule and Invoice, typically mailed with the student's payment, is requested for confirmation of registration. All students whose registrations are not confirmed are notified in writing that their registrations will be canceled and are asked to contact the Student Accounts Office immediately.

Charges for residence halls and meal plans are in accordance with license agreements signed by the student. Questions concerning those charges should be referred to the Community Living and Learning Center or Auxiliary and Institutional Services, respectively.

Registration Holds—Students may not attend classes in any semester or summer session without the express written permission of the dean of students if they have not registered due to a hold on their student account. Failure to adhere to registration and enrollment procedures could result in a violation of the Policy on Academic Integrity and/or the University's Code of Student Conduct, both of which are reported to bar examiners.

Monthly Payment Plan—This payment plan is open to all students and is available for the fall and spring semesters only. Students must complete and submit an application by August 15 for the academic year or by January 5 for the spring semester to participate in the plan. Upon approval of the application, the student will be billed for each payment. The monthly payment plan for the academic year begins in June and ends in March, with the first five payments applied to the fall account and the second five applied to spring. For spring semester only, the plan begins in November and ends in March. Under the plan, all payments are due on the first of each month. The student will receive a monthly bill, but no interest or late fees will be charged provided payments are received as scheduled. Students who enroll in the plan after the first month must make up all payments to the month of enrollment. Interest and a late payment fee are assessed all accounts not paid in full by October 5 for fall and March 5 for spring. An outside vendor administers the plan and charges a one-time participation fee in addition to interest and late fees for any payments received late. For more information, see www.gwu.edu/~sao/payment_plan.html.

Third-Party Payment—The University accepts employer vouchers or purchase orders that are not contingent upon receipt of grades. Under all circumstances, the charges for tuition and fees remain the responsibility of the student. Authorization from a sponsor to be billed for a student's charges must be received in the Student Accounts Office by the end of the third week of the fall or spring semester. A late authorization fee may be incurred for responses received after these times. Bills are mailed to sponsors in October for the fall semester and in February for the spring semester. Should a sponsor fail to remit payment to the University, the University will contact the student for payment. Students whose employers or sponsors reimburse them for tuition and fees after receipt of grades must pay in full upon receipt of the Schedule and Invoice or at the time of registration to avoid interest, late fees, and/or cancellation of registration. Students whose tuition is paid in full or part by employee benefits or teacher tuition remission must pay any remaining balance by the stated due date to avoid interest, late fees, and/or cancellation of registration.

Past Due Accounts—Accounts that are past due are encumbered by the University. A student whose account is encumbered may not register for future semesters and may not receive diplomas or transcripts. Late payment fees and interest may also be assessed each month that the account has an overdue outstanding balance. Please see the University's Tuition Payment Disclosure Statement at www.gwu.edu/~sao/disclosurestatement.pdf for more information on those fees and billing practices. Accounts that are more than 90 days past due are referred to an agency and/or attorney for collection. The student is then responsible for all

charges, costs, and fees due to, or incurred by, the University as well as all costs, fees, and charges incurred by the agency and/or attorney, including attorney's fees. Students whose registrations have been revoked or canceled for failure to make timely payments are not permitted to attend class and may not occupy University housing.

Dishonored/Returned Checks—A student whose check is returned unpaid by the bank for any reason will be charged a returned check fee and will be responsible for any associated costs and/or attorney's fees incurred by the University should a civil lawsuit or other collection effort be instituted to collect on such dishonored check. In any case where the University has reason to believe that a student presented a dishonored check in bad faith, the University may, in addition to any collection efforts, refer the matter to the proper authorities for criminal prosecution.

Withdrawals and Refunds

Applications for withdrawal from the University must be made in person or in writing to the dean of students. After the first two weeks of class, applications for changes in class schedule must have the written approval of the instructor, the dean of students, and the director of the Records Office. Under no circumstances may a student withdraw from a course after the last day of classes in a semester.

In authorized withdrawals and changes in schedule, cancellations of semester tuition charges and fees will be made in accordance with the following schedule for the fall and spring semesters:

1. *Complete withdrawal* from the University:
   Withdrawal dated on or before the end of the first week of the semester 80%
   Withdrawal dated on or before the end of the second week of the semester 60%
   Withdrawal dated on or before the end of the third week of the semester 40%
   Withdrawal dated on or before the end of the fourth week of the semester 25%
   Withdrawal dated after the fourth week of the semester . . . . . None
2. *Partial withdrawal:* If the change in program results in a lower charge, the refund schedule above applies to the difference.
3. Regulations governing student withdrawals as they relate to residence hall and food service charges are contained in the specific lease arrangements.

Courses that do not follow the traditional semester may have different refund policies.

The above information regarding cancellation of tuition charges and fees after withdrawal from the University may not apply to entering students who are recipients of federal aid; those students should check with the Student Accounts Office for the applicable cancellation schedule.

Refund policies of the University are in conformity with guidelines for refunds as adopted by the American Council on Education.

In no case will tuition be refunded or reduced because of absence from classes.

Authorization to withdraw and certification for work done will not be given a student who does not have a clear financial record.

Financial Aid

The Law School assists many students in obtaining financial aid through grants, various federal and commercial loan programs, or a combination of these kinds of assistance.

Juris Doctor Program

All admitted J.D. applicants are considered for the limited number of merit-based scholarships; no special application is necessary for this consideration. J.D. students may apply for the following types of financial aid: Law School tuition grants, Subsidized and Unsubsidized Federal Stafford Loans, Federal Perkins Loans, and private, credit-based educational loans. A student must apply for financial aid in each year it is needed; an award of aid in one year is not a guarantee that aid will be awarded in subsequent years. The Committee on Student Financial Aid begins making awards in March; funds are limited. No awards will be offered to an applicant until the admission process has been completed.

Law School tuition grants are available to full- and part-time students and are awarded primarily on the basis of financial need. Financial need is the difference between the total cost of attending the Law School and a student's personal and/or family contribution, $18,500 in Stafford Loans (see below), and any other assistance the student receives.

Through the Federal Stafford Loan program, students may apply for a maximum of $18,500 annually to an aggregate maximum of $138,500 undergraduate and graduate Stafford Loans. Interest is not charged to the student on the subsidized portion of the loan (up to $8,500 per year) while the student is enrolled, during a specified grace period, and during approved periods of deferment of repayment. Repayment begins six months after the borrower leaves school or drops below half-time attendance. The Unsubsidized Stafford Loan (up to $10,000 per year if the student has borrowed the full $8,500 subsidized portion) accrues interest while the student is in school. Payments on the Unsubsidized Stafford Loan may be deferred during the in-school period and for six months after graduation. Repayment of the Stafford Loan is completed over a ten-year period, unless the borrower chooses to extend payments through loan consolidation or other payment plans after graduation. The in-school interest rate on the Unsubsidized Stafford Loan is variable, based on the 91-day Treasury bill rate plus 1.7%, capped at 8.25%. Under current federal regulations, all students receiving Stafford Loans may be assessed an origination fee of 3% of the principal and may be charged an additional guarantee fee of up to 1%. Students may apply for the Federal Stafford Loan after the application for admission is complete and the first tuition deposit has been paid.

Federal Perkins Loans are available to a limited number of students, in varying amounts, at a fixed interest rate of 5%. The combined undergraduate and graduate amount a student may borrow under this program is $30,000. Repayment may be made over a five- to ten-year period beginning nine months after graduation. Like the Stafford Loan, the federal government pays the interest on the Perkins Loan while the student is enrolled at least half time, during the nine-month grace period, and during approved periods of deferment of repayment.

Students may also apply for commercial student loans. Also called private, alternative, supplemental, or credit-based, these commercial loans are not guaranteed by the federal government. Commercial loans have different application requirements and repayment plans than traditional student loan programs. Commercial lenders apply a credit-scoring process to an applicant's credit history, rating such variables as consumer debt payment history, number of charge cards and outstanding balances, and future ability to repay the loan. The Law School recommends that applicants for commercial loans check their credit report well in advance of applying. Applicants with a good credit history usually receive better

loan terms. While there are a number of commercial loan sources, the Law School has selected several lenders as its preferred sources of credit-based loans.

Detailed instructions for applying for all of these forms of financial aid are available from the Law School's Financial Aid Office and are mailed in May to admitted applicants who have paid the first tuition deposit.

Master's and Doctoral Programs

Master's and doctoral students may be considered for the following sources of merit-based aid: the Momsen, Leonardos Scholarship for Brazilian Graduate Law Students for the study of U.S. constitutional law and the law of patents and trademarks, the Randolph C. Shaw Graduate Fellowship in Environmental Law, the Honorable Gerald J. Mossinghoff Fellowship for graduate research in intellectual property law, the William N. Hedeman, Jr., Memorial Scholarship for study of environmental issues, the David and Sherry Berz Summer Fellowship in Environmental Law, and Graduate Honor Fellowships. Applicants who wish to be considered for any of these fellowships should submit a letter of interest to the appropriate graduate admissions office at the time application for admission is made. The application for admission as well as all supporting documents must be received by the relevant deadline in order for an applicant to be considered for a fellowship.

Enrollment Requirements for Loan Eligibility

Students borrowing Federal Title IV (i.e., Stafford and Perkins) and/or commercial educational loans must be registered at least half time in each semester of the loan period for which funds are requested. For this purpose, half-time enrollment per semester is 6 credit hours for J.D. students and 5 credit hours for LL.M. students. The total number of credit hours for which a student registers is used to determine the education cost for the loan period.

Sources of Financial Aid

Financial aid has been made available from many friends and alumni of the Law School. The scholarships include the following:

Arnold & Porter Minority Scholarship
Dorothy Dubois Walker Beach Law School Scholarship
Harriet C. Beasley Scholarship
William E. Booth Memorial Scholarship
Mildred Gott Bryan Scholarship
Samuel M. and Mary T. Burgess Scholarship
Jacob Burns Merit Scholarship
Charlton M. Clark Law Scholarship
Faye F. and Sheldon S. Cohen Scholarship
Manuel F. Cohen Memorial Scholarship
Columbian Women Scholarship
Douglas E. Davidson Merit Scholarship
The Dennis Dearing Scholarship
Charles Worthington Dorsey Memorial Scholarship
Clifford A. Dougherty Law Alumni Scholarship
Darrell L. Dreher Scholarship
Irene and Jared M. Drescher Scholarship
John Howard Earle Scholarship in Antitrust Law
Lori and Dan Efroymson Scholarship
Marshall B. Finnegan Memorial Fellowship
Maxine Relle and Augustus S. Goodyear Scholarship
Gary C. and Leslie B. Granoff Scholarship
Samuel Green Phi Delta Phi Scholarship
A.J. Harris II Scholarship
Patricia Roberts Harris Scholarship
George S. Hastings Intellectual Property Fund

William N. Hedeman, Jr., Memorial Scholarship
Raymond F. Hossfeld Dean's Scholarship
Howrey & Simon Scholarship
Hunton & Williams Scholarship
Thomas Searing Jackson Scholarship
John S. Jenkins Scholarship
William P. Keith Law Student Scholarship
Jacob and Charlotte Lehrman Foundation Clinical Scholarship
Stephen A. Lerman Merit Scholarship
Mary and Daniel Loughran Graduate Scholarship
S.N. Ferris and Berniece Luboshez Memorial Fund
Manatt-Phelps Banking Law Scholarship
Leah B. McCartney Scholarship
Robert Netherland Miller Scholarship
The Momsen, Leonardos Endowment
The Honorable Gerald J. Mossinghoff Fellowship for Graduate Research in Intellectual Property
Colonel Charles M. and Elizabeth S. Munnecke Law School Scholarship
National Congress of American Indians/Charles A. Hobbs Scholarship for Indian Students
New Jersey Merit Scholarship
Perry Endowed Scholarship
Phi Delta Delta Fraternity Scholarship
Phi Delta Gamma Scholarship Endowment
John T. and Virginia H. Sapienza Scholarship
George H. and Mae L. Scatterday Scholarship
Frances L. Schilz Scholarship
Walter L. Schwartz Scholarship
J.B. and Maurice C. Shapiro Public Service Fellowship
Randolph C. Shaw Graduate Fellowship in Administrative Law
Donald C. Snyder Scholarship
Yvonne G. Trout Scholarship
L. Marie Van Hise Scholarship
James Douglas Welch Memorial Scholarship
Frank S. Whitcomb Scholarship
Glen A. Wilkinson Scholarship
J. McDonald and Judith K. Williams Scholarship
Alice C. and James O. Wright Merit Scholarship

Public Interest Support Funds

Jacob and Charlotte Lehrman Foundation Scholarship—A third-year student in the clinical program is selected annually to serve as a student director, performing administrative duties in connection with the Civil Litigation and other Clinics. The student director assigns and supervises student caseloads, controls client intake, and acts as a liaison between law students and staff attorneys. The recipient of the scholarship receives a grant for partial tuition.

Law School Summer Subsidies—Each year, the Law School awards subsidies to students who engage in full-time public interest work during the summer. These awards encourage students to pursue careers in public service endeavors, enable students to gain practical experience in the field of public service, and provide public service organizations with help they otherwise might not be able to afford. The sources of the funds include the Law School itself as well as privately created endowments in the names of J.B. and Maurice C. Shapiro, Murray Snyder, and Reuben A. Zubrow. These subsidies cover a wide variety of public interest work, such as representation of otherwise under-represented populations, advocacy for organizations that pursue environmental issues, and legal work on issues of concern to particular ethnic communities. Award recipients have served populations locally, nationally, and internationally. In addition to these subsidies, the Equal Justice Foundation, a law student organization, holds an annual fund-raising auction to support summer grants.

J.B. and Maurice C. Shapiro Public Service Fellowships—Shapiro Public Service Fellows are selected on the basis of academic merit and commitment to public service, as demonstrated during their first two years of law school. As a secondary consideration, the amount of each award reflects the student's financial need.

These awards make it possible for third-year students to pursue part-time public interest employment that offers no compensation. Each recipient is required to work approximately 20 hours per week during his or her third year of law school, serving a nonprofit public service organization in the Washington metropolitan area.

Loan Reimbursement Assistance Program—The Law School provides assistance in repayment of legal education debt through its Loan Reimbursement Assistance Program (LRAP). Law School graduates with educational debt who choose public interest employment may receive "forgivable" loans of up to $8,000 per year. LRAP awards will depend on the nature of the employment, the applicant's commitment to public interest work, the applicant's and employer's financial need, and the amount of the applicant's educational debt. The number and size of awards vary from year to year, depending on the number of applications and the availability of funds.

Public Interest Fellowship Program—In order to support public interest work, the Law School awards ten fellowships each year to J.D. students who take low-paying public interest jobs over the summer. The fellowship award is in the form of a tuition reduction in the following fall semester.

Loan Funds

Through the generosity of friends of the University, a number of loan funds are available. Those that support longer-term loans include the Samuel M. and Mary T. Burgess Revolving Loan Fund, the Morris and Gwendolyn Cafritz Foundation Minority Law Student Loan Fund, the Frederick O. Graves Law Student Loan Fund, and the Susan and Anne Kondrup Memorial Fund. The Law School Loan Fund, which provides short-term emergency loans, is a consolidation of the following: Lyle T. Alverson Loan Fund; Robert Ash Loan Fund; George R. Beneman Loan Fund; Robert M. and Mary McConnel Cooper Loan Fund; Robert McKinney Cooper Memorial Loan Fund; Mitchell S. Cutler Memorial Loan Fund; J. Forrester Davison Loan Fund; District of Columbia Bar Association Loan Fund; J.W. Ehrlich Foundation Loan Fund; Newell W. Ellison Loan Fund; Louise F. Freeman Memorial Student Loan Fund; Harold L. and Violet George Foundation Loan Fund; George Washington Law Association Loan Fund; Morris Golub Loan Fund; John B., Jr., and Carol H. Holden Loan Fund; Jephson Educational Trust Loan Fund; Law Association Loan Fund for law classes of 1912, 1918, 1921, 1924, 1929, 1931, 1933, 1935, 1936, 1937, 1938, 1939, 1941, 1942, 1945, 1950, 1951, 1952, 1953, 1955, 1959, 1960, 1961, 1962, 1963, 1964, 1965; Oscar Lawler Memorial Loan Fund; Horace L. Lohnes Memorial Assistance Fund; Jessie B. Martin Loan Fund; Robert N. Miller Loan Fund; Joan Murphy Loan Fund; Nu Chapter, Kappa Beta Pi Legal Association International Loan Fund; Mike Pelekiri Loan Fund; Phi Delta Delta Loan Fund; W. Theodore Pierson Loan Fund; Rockport Loan Fund; Samuel L. Samuel Loan Fund; H. William Tanaka Law Students Assistance Loan Fund; Orville Hassler Walburn Memorial Loan Fund; Kennedy and Judith Watkins Law Student Loan Fund; Ralph E. West Memorial Loan Fund; W.H. Williams Memorial Student Loan Fund; Patricia A. Willoner Loan Fund; Ruth F. Wilson Loan Fund; Yadao and Kanemoto Loan Fund; and Samuel Green Memorial Loan Fund.

Veterans Benefits

The veterans counselor, located on the third floor of Rice Hall, 2121 I Street, N.W., assists students entitled to educational benefits as veterans or as widows or children of deceased or totally disabled veterans with any problems that may arise concerning their benefits. This office also processes certification of enrollment and attendance to the Veterans Administration so that monthly allowances will be paid.

When feasible, students entitled to benefits as veterans or dependents of veterans should consult with the veterans counselor prior to submitting an application to the Veterans Administration. All such students should obtain the instruction sheet issued by the Office of the Registrar, which sets forth requirements to be fulfilled before certification of enrollment can be made to the Veterans Administration and which includes other information of general interest.

Awards

Excellence in a Field of Study

American Bankruptcy Institute Medal for Excellence in Bankruptcy Studies—Given to a member of the graduating Juris Doctor class who has demonstrated excellence in the field of debtor and creditor law.

American Bar Association/Bureau of National Affairs Award—Given to the members of the graduating Juris Doctor class who have demonstrated excellence in the study of health law.

American Bar Association/Bureau of National Affairs Award—Given to the members of the graduating Juris Doctor class who have demonstrated excellence in the study of intellectual property law.

American Bar Association/Bureau of National Affairs Award—Given to the members of the graduating Juris Doctor class who have demonstrated excellence in the study of labor and employment law.

Chris Bartok Memorial Award in Patent Law—Given to the member of the graduating Juris Doctor class who exhibited excellence in the study of Patent Law.

Henry R. Berger Award—Given to a member of the graduating Juris Doctor class who demonstrated excellence in the area of tort law.

Ogden W. Fields Labor Law Award—Given to the member of the graduating Juris Doctor class who has demonstrated the highest overall proficiency in labor law.

Finnegan Prize in Intellectual Property Law—Given to a Juris Doctor or Master of Laws student for the best publishable article on an aspect of intellectual property law. Established by the law firm Finnegan, Henderson, Farabow, Garrett & Dunner.

Phi Delta Phi Award—Given to the members of the graduating Juris Doctor class who have demonstrated excellence in the courses in professional responsibility, ethics, and jurisprudence.

Joel B. Rosenthal Commercial Law Award—Given to a member of the graduating Juris Doctor class who has demonstrated excellence in the area of commercial law.

Laurence E. Seibel Memorial Award in Labor and Employment Law—Given to a member of the graduating Juris Doctor class who has demonstrated excellence in the courses in labor and employment law.

Richard L. Teberg Award—Given to the member of the graduating Juris Doctor class who has demonstrated the highest overall proficiency in the courses in securities law.

Patricia A. Tobin Government Contracts Award—Given to a member of the graduating Juris Doctor or Master of Laws class who has demonstrated excellence in the area of government contracts law.

Jennie Hassler Walburn Award—Given to a member of the graduating Juris Doctor class for outstanding performance in the field of civil procedure. Established by bequest of Professor Orville Hassler Walburn in memory of his mother.

Imogen Williford Constitutional Law Award—Given at graduation to an outstanding Juris Doctor student in the field of constitutional law. Established by Imogen Williford, J.D. '29.

Excellence in Oral Advocacy

Michael J. Avenatti Award for Excellence in Pre-Trial and Trial Advocacy—Given to a member of the graduating Juris Doctor class who has demonstrated excellence in the courses in pre-trial and trial advocacy.

Jacob Burns Award—Given at graduation to the two members of the winning team in the Van Vleck Moot Court Competition. Established by Jacob Burns, LL.B. '24, LL.D. '70, formerly Trustee of the University.

Judge Albert H. Grenadier Award—Given to the members of the graduating Juris Doctor class who have represented the Law School at the Mid-Atlantic Regional Jessup Moot Court Competition.

Excellence in Clinical Practice

Manuel and Ana María Benítez Award for Clinical Excellence in Immigration Law—Given to a member of the graduating Juris Doctor class who has demonstrated extraordinary ability in his or her work in the Immigration Clinic, and who possesses the personal qualities that distinguish Manuel and Ana María Benítez—both immigrants to the United States from Mexico—including initiative, creativity, zeal, loyalty, and integrity.

John F. Evans Award—Given to a member of the graduating Juris Doctor class for outstanding achievement in the criminal division of the Law Students in Court Program.

Richard C. Lewis, Jr., Memorial Award—Given to a member of the graduating Juris Doctor class who has exhibited extraordinary dedication to his or her work in the Jacob Burns Community Legal Clinics and unusual compassion and humanity toward clients and colleagues.

West Publishing Awards—Given to members of the graduating Juris Doctor class for clinical achievement in consumer law and in family law.

Community Legal Clinics Volunteer Service Award—Given to the member of the graduating Juris Doctor class who excelled in volunteering his or her time and energy to promote the goals and ideals in the public interest by contributing to the efforts of the Jacob Burns Community Legal Clinics.

Distinguished Accomplishment

ALI–ABA Scholarship and Leadership Award—Given to the member of the graduating Juris Doctor or Master of Laws class who best represents a combination of scholarship and leadership, the qualities embodied by the American Law Institute (ALI) and the American Bar Association (ABA).

Michael D. Cooley Memorial Award—Given to that individual in the graduating Juris Doctor class who has been most successful in maintaining his or her compassion, vitality, and humanity during law school. The recipient of this award is selected by the graduating Juris Doctor class.

The George Washington Alumni Association Award—Given to a member of the graduating Juris Doctor class who has demonstrated extraordinary leadership and commitment to the University and its community.

Justice Thurgood Marshall Civil Liberties Award—Given in honor of the late Supreme Court Associate Justice to a member of the graduating Juris Doctor class who has demonstrated outstanding performance in and dedication to the field of civil rights and civil liberties.

National Association of Women Lawyers Outstanding Law Graduate Award—Given to a member of the graduating Juris Doctor or Master of Laws class who has contributed to the advancement of women in society, promoted issues and concerns of women in the legal profession, achieved academic success, and earned the respect of the Law School faculty and administration.

Thelma Weaver Memorial Award—Given to a foreign student member of the graduating Master of Laws class who has contributed most to the intellectual and professional life of the Law School, its students, and its faculty. Established by her husband, Professor David B. Weaver, in recognition of her many contributions to the work of the University.

Overall Academic Excellence

Anne Wells Branscomb Award—Given to the member of the graduating class who attained the highest average grade in the entire course of the evening division for the degree of Juris Doctor.

Willard Waddington Gatchell Award—Given to the three members of the graduating class who attained the highest average grade in the entire course for the degree of Juris Doctor. Established by bequest of Eona Burnett Gatchell in memory of her husband.

Charles Glover Award—Given to the member of the graduating class who has attained the highest average grade in the third-year, full-time course for the Juris Doctor degree. Established by Charles Carroll Glover, Jr., formerly Trustee of the University, in memory of his great-grandfather, an illustrious member of the District of Columbia bar.

Kappa Beta Pi Award—Given by the Eta Alumnae Chapter to the female members of the graduating class in the full- and part-time divisions who attained the highest average grade in the first-year course of study for the Juris Doctor degree.

John Bell Larner Award—Given to the member of the graduating class who attained the highest average grade in the entire course for the Juris Doctor degree.

John Ordronaux Awards—Given to the member of the graduating Juris Doctor class who attained the highest average grade in the first-year, full-time course of study and to the member of the graduating Juris Doctor class who attained the highest average grade in the second-year, full-time course of study.

General Information

Day and Evening Classes

Most day classes are scheduled between 8:50 a.m. and 5:50 p.m., Monday through Friday. The majority of evening classes meet from 6:00 to 8:00 p.m., Monday through Friday. There may be an occasional Saturday course offering.

A 4-credit course, e.g., *Evidence,* meets two evenings a week; most 3-credit courses, e.g., *Administrative Law,* meet one evening a week plus alternate Friday evenings throughout the semester; a 2-credit course, e.g., *Contracts II,* meets one evening a week. The evening division conforms to the academic standards of the day division, with full-time faculty teaching all courses in the required and core curriculum.

Examinations for both day and evening classes may be given in the afternoon. Examinations for day students may be given in the evening.

Registration

Each student must register before attending classes. No student will be registered until proper credentials have been filed (see Admission).

No registration is accepted for less than a semester or summer session. A student may not register concurrently in George Washington University and another institution. Registration in more than one school of the University requires the written permission of the appropriate deans concerned, prior to registration.

Eligibility for Registration

A student who is suspended or whose record is not clear for any reason is not eligible to register.

New Student—Upon receipt of a final letter of admission a new student is eligible for registration on the stated days of registration.

Readmitted Student—A student previously registered who was not registered for courses during the preceding semester or summer session and who has not been granted a leave of absence must apply for and receive a letter of readmission before becoming eligible for registration.

Graduation Requirements

Degrees are conferred in January, May, and August.

To be recommended by the faculty for graduation, a student must have met the admission requirements of the Law School; completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which the student is registered; and be free from all indebtedness to the University. Registration is required for the semester or summer session at the close of which the degree is to be conferred.

Application for Graduation—An application for graduation must be filed by the date indicated in the Academic Calendar during the last semester or summer session of the final year. Students completing degree requirements during the summer session and fall semester will be awarded diplomas (no formal convocation) on August 31 and January 30, respectively, provided they have completed all degree requirements and have applied for graduation as part of registration. If they wish, such students may participate in the May Commencement.

Transcripts of Record

Official transcripts of student records will be issued by the Office of the Registrar on request of the student or former student who has a clear financial record. A fee of $5 is charged for each transcript.

Policy on Academic Integrity

The Law School seeks to foster academic excellence in the study of law and to prepare students for participation in the legal profession. Academic excellence, in any discipline, depends on an environment of honesty, integrity, and fairness. This general requirement is heightened by the special mission of a law school—to prepare students for a practice that relies heavily on the honor of its participants. The Law School community expects its members to uphold the highest ethical standards. It expects students to prepare for the duties of honesty and integrity that they will undertake as lawyers by practicing honesty and integrity throughout their time as students.

The responsibility for creating and maintaining academic integrity in the Law School community is shared by all members of the community—students, faculty, staff, and deans. *The George Washington University Law School Policy on Academic Integrity* defines and prohibits academic dishonesty. It prescribes procedures to be followed in cases of academic dishonesty. It also exhorts all members of the Law School community to foster a culture of honesty, integrity, and professional responsibility throughout the community.

The Law School's administrators shall make this policy available to all students and faculty members. It is the responsibility of all students to read and familiarize themselves with this policy and also the University's *Guide to Student Rights and Responsibilities*, which is available from the Dean of Students' Office. If, in light of the Law School community's norm of academic integrity, the propriety of certain conduct is in doubt, students must seek the advice of Law School faculty or administrators. Members of the Law School community are presumed to be familiar with the Policy on Academic Integrity and are responsible for conforming to its requirements.

Students who are charged with violations of the Policy on Academic Integrity or the University's Code of Student Conduct, whether they are found responsible for such charges and/or sanctions apply, must report any and all charges and their disposition to state bar examiners if so required on the bar application form. The Law School will similarly report any charges or sanctions to state bar examiners when the bar certification form requires such a disclosure.

Student Activities and Student Life

Enrichment Program

The Law School supplements and enriches its diverse programs by bringing to the school eminent legal scholars, judges, distinguished members of the bar, members of Congress, and high-level government officials to offer lectures and informal seminars with students and faculty. Participants in the Enrichment Program have included columnist Anthony Lewis, Supreme Court Justices Lewis Powell, Antonin Scalia, Sandra Day O'Connor, Anthony Kennedy, and Ruth Bader Ginsburg, Senator Bill Bradley, Judge Richard Posner of the U.S. Court of Appeals for the Seventh Circuit, author Scott Turow, attorney Alan Dershowitz, and Treasury Secretary John W. Snow. The Enrichment Program, funded largely by gifts from alumni and friends of the Law School, includes four endowed lectureships and a visiting scholar program. The endowed lectureships are the Manuel F. Cohen Memorial Lecture, the J.B. and Maurice C. Shapiro Lectures, the Susan N. and Augustus diZerega, Jr., Lecture, the Brand–Manatt Lecture, and the Shulman Foundation Lecture.

Publications

The George Washington Law Review, published six times a year, is edited and managed by the students of the Law School. The *Law Review* is known for its emphasis on federal and public law; however, it is also devoted to research in other important legal areas. The staff of the *Law Review* is selected on the basis of grades and a writing competition. The editorial board is selected from those students who have successfully completed the first year of *Law Review* work.

The George Washington International Law Review is managed and edited by law students. It presents articles and commentaries on public and private international financial development, comparative law, and international law. The staff of the *International Law Review* is selected on the basis of criteria identical to those used by the *Law Review*.

The Public Contract Law Journal is produced jointly by the Law School and the Public Contract Law Section of the American Bar Association. The journal is published quarterly and is edited and managed by J.D. and LL.M. students. The selection criteria for J.D. staff members is the same as those used by the *Law Review*. LL.M. students submit a resume, writing sample, and personal statement to be considered for membership.

The American Intellectual Property Law Association Quarterly Journal, a publication of the AIPLA, is edited and managed by law students under the direction of the editor-in-chief, Professor Joan Schaffner. J.D. student staff members are selected on the basis of a national writing competition.

Skills Boards

Lawyering skills competitions and programs provide realistic training in client counseling, negotiation, trial advocacy, and appellate advocacy. The Law School's student-managed Alternative Dispute Resolution (ADR) Board, Mock Trial Board, and Moot Court Board are dedicated to the promotion and development of these skills among the student body. The ADR Board administers client counseling and negotiation programs at the Law School and also sponsors lectures by practitioners on emerging dispute resolution techniques. The Mock Trial Board sponsors civil and criminal intrascholastic trial competitions and sends student teams to interscholastic trial competitions nationwide. The Moot Court Board administers intrascholastic, appellate-level competitions in the areas of constitutional law, international law, government contracts law, and intellectual property law. The Moot Court Board also selects and sponsors students to represent the school at interscholastic competitions across the nation and sponsors an invitational interscholastic competition, the National Security Law Moot Court Competition.

Law Student Organizations

American Constitution Society
Amnesty International Legal Support Group
Asian–Pacific American Law Student Association
Black Law Student Association
Christian Law Society
Corporate Law Society
Criminal Law Society
Culture of Life Legal Society
Domestic Violence Coalition
Entertainment and Sports Law Association
Environmental Law Association
Equal Justice Foundation
Evening Law Student Association
The Federalist Society
Feminist Forum
Forensic Science and the Legal Profession
GW Law Democrats
GW Law Softball Club
GW Law Students for Choice
Hispanic Law Student Association
International Law Society
Jewish Law Student Association
J. Reuben Clark Law Society
Lambda Law
Law Association for Women
Law Revue
Muslim Law Student Association
National Lawyers Guild
Nota Bene
Phi Alpha Delta
Phi Delta Phi
South Asian Law Student Association
St. Thomas More Society
Street Law
Student Animal Legal Defense Fund
Student Bar Association
Student Communications and Information Law Association
Student Health Law Association
Student Intellectual Property Law Association

Facilities and Services

The Jacob Burns Law Library

The Jacob Burns Law Library serves the students and faculty of the Law School by offering a wealth of legal and law-related information in a variety of formats. A collection strong in historical material has been integrated with automated resources to meet the needs of researchers in many specialized areas. The Library itself, housed on six levels, offers a wide range of study areas, including several large, comfortable reading rooms, and a number of small conference rooms and study cubicles.

A staff of 40 librarians and support staff, a number of whom are trained in both law and information science, is the key to using the collection of more than 500,000 volumes and volume equivalents. The Library's sophisticated online catalog, JACOB, can be used both to locate materials within the facility and to access the online catalogs of neighboring institutions, including the Library of Congress. Emerging technology has been fully utilized with the development of a CD-ROM network that provides simultaneous access to a number of databases by multiple users and subscriptions to many web-based services. All of these electronic resources can be used from a variety of stations throughout the library. Two computer labs can be used for word processing, access to LEXIS and WESTLAW, and e-mail. Additional terminals dedicated to the use of e-mail are available, as well as a wireless network for linking notebook computers to the GW network.

The collection itself, while broad-based, focuses on Anglo-American resources and is particularly strong in the areas of environmental law, intellectual property, government procurement and federal practice, tax law, and labor law. A large international and comparative law collection focuses on the areas of human rights, law of the sea, commercial transactions, intellectual property, and environmental law.

The Library attempts to collect materials in a variety of related areas such as history, economics, and political science for individuals conducting interdisciplinary research. In addition, the excellent collections of the University's two other libraries, the Gelman Library and the Himmelfarb Health Sciences Library, are both within a few blocks of the Law School.

Career Development

The Career Development Office provides a full range of services to support the career decision-making process. Students, graduates, and prospective employers are served through a variety of programs, including systems of job-vacancy advertising; newsletters of current career information; interviewing programs; individual and group counseling on resume preparation, interviewing skills development, and job-search strategy; a career resource library; forums and panel presentations covering legal and alternative career topics and employment options; and an alumni network.

Continuing Legal Education

Members of the Bar who wish to keep abreast of current developments in the law may register for any of the courses in the Law School on a noncredit basis as Continuing Legal Education students. Specific courses are also open to nonlawyers whose special qualifications justify their registration. Such students do not take examinations in courses and no grades are recorded for their work.

A simplified admission and registration procedure is used and must be completed on or before the last day of regular registration for the appropriate semester. Continuing Legal Education students pay only the tuition fee on the semester-hour basis. They may not participate in student activities or benefit from the medical privileges of the University. (Continuing Legal Education registrations are subject to cancellation if courses are filled by regularly registered students.)

Housing and Food Service

Apartments are made available to entering law students on a first-come, first-served basis in Columbia Plaza, a privately owned complex located at 2400 Virginia Avenue, N.W., approximately five blocks from the Law School. For more information call the Office of Housing Services at (202)994-6688.

The University's Off-Campus Housing website (www.och.gwu.edu) posts a variety of local housing options for students, including efficiencies, apartments, and group houses. Prices for housing vary considerably and generally match those in other major metropolitan areas. Though there is limited off-campus housing within walking distance of the school, many students live in other parts of the city or in nearby suburbs and take advantage of the excellent public transportation system in the metropolitan area, which includes a Metro stop on campus.

Contract food service is available from August to May, based on the undergraduate academic calendar of registration, exams, and vacation periods. Accommodations for the law school calendar are made. Rates for the various meal plans are available from the Residential Life Office. Students who observe the Jewish dietary laws can write to make arrangements with the Office of Residential Life regarding the B'nai B'rith Hillel Foundation Kosher Meal Plan.

Student Health Service

The Student Health Service is an outpatient clinic located at 2141 K Street, N.W., Suite 501.

The Health Service is staffed by physicians, nurse practitioners, and physician assistants who are capable of addressing most of students' medical problems. Visits may be either arranged by appointment or, during certain hours, secured on a walk-in basis. Most routine laboratory tests may be performed in the Health Service lab at cost, many common medications are stocked to fill students' prescriptions, and allergy shots and immunizations are administered by the staff nurse for a minimal charge. A psychiatrist works in the Health Service to assist students with mental health concerns.

For serious emergencies occurring during hours when the Student Health Service is closed, students may go to the Emergency Room of the University Hospital for treatment. This arrangement is for emergency care only and all fees are the responsibility of the student.

Students must be currently enrolled on campus in the University to receive treatment at the Student Health Service. Students enrolled in off-campus programs and the Continuing Legal Education Program are not eligible. Students who so desire may engage physicians and nurses of their own choice, but these students will be responsible for all fees charged. The bills incurred from all services rendered outside the Student Health Service (for example, x-ray work, laboratory work, and referrals to specialists or other outside physicians) are the responsibility of the student.

Health and Accident Insurance

The University recommends that all students be covered by health and accident insurance. For information on group health insurance options offered through the University, students should contact the Chickering Group at (800)213-0579.

Immunization Requirements

It is the law in the District of Columbia that all students under the age of 26 have a record on file with the Student Health Service documenting immunity to Measles, Mumps, and Rubella (two immunizations with the initial dose given after the first birthday or positive titers), Varicella (chickenpox—by immunization,

documented history of disease or positive titers) and a current Tetanus/Diphtheria booster (within 10 years prior to the beginning of the semester). This requirement applies to all students regardless of their program of study or degree status. Students registering for the first time will be able to do so without complete records on file, but any subsequent registration will be blocked if this requirement has not been fulfilled. Immunization forms are sent out by the GW admitting office. Forms can be downloaded from gwired.gwu/edu/shs. In addition to the required immunizations, the Hepatitis B and Meningitis vaccines are recommended. The Student Health Service can give all inoculations on a fee for service basis. Further information is available at (202)741-2650.

Disability Support Services

Disability Support Services provides and coordinates support services for students with a wide variety of disabilities, as well as those temporarily disabled by injury or illness. Accommodations are available through DSS to facilitate academic access for students with disabilities. Services provided without charge to the student may include orientation to campus, registration assistance, readers, interpreters, scribes, learning disabilities advising, adaptive materials and equipment, assistance with note taking, laboratory assistance, test accommodations, regular advising, and referrals. DSS does not provide content tutoring, although it is available on a fee basis from other campus resources. The University does not pay for personal attendant care.

University Regulations

University Policy on Equal Opportunity

The George Washington University does not unlawfully discriminate against any person on the basis of race, color, religion, sex, national origin, age, disability, veteran status, or sexual orientation. This policy covers all programs, services, policies, and procedures of the University, including admission to educational programs and employment. The University is also subject to the District of Columbia Human Rights Law.

Inquiries concerning the application of this policy and federal laws and regulations regarding discrimination in education or employment programs and activities may be addressed to Susan B. Kaplan, Associate Vice President for Human Resources, The George Washington University, Washington, D.C. 20052, (202)994-4433, or to the Assistant Secretary for Civil Rights of the U.S. Department of Education.

University Policy on the Release of Student Information

The Family Educational Rights and Privacy Act (FERPA) applies to institutional policies governing access to and release of student education.

The University will release the following directory information upon request: name, local address, telephone number, and e-mail address; name and address of emergency contact; dates of attendance; school or division of enrollment; field of study; enrollment status; credit hours earned; degrees earned; honors received; participation in University-recognized organizations and activities (including intercollegiate athletics); and height, weight, and age of members of athletic teams, as well as likenesses used in University publications. A student who does not wish such directory information released must file written notice to this effect in the Office of the Registrar at the beginning of each semester or session of enrollment.

The University's full policy statement on the release of student information is published in the *Guide to Student Rights and Responsibilities,* available in the Office of the Dean of Students.

Policy Regarding Students Called to Active Military Duty

Any student who is a member of a military reserve unit or the National Guard and is activated or called to active duty early in a semester or summer session automatically will be entitled to a full refund of all tuition and fees that he or she has paid toward the expenses of that academic term. If the notification of the call to active duty comes after the mid-term examinations or after other substantial graded work has been completed, the student will have the option of either taking a full refund of tuition and fees or taking an Incomplete in his or her courses with the privilege of returning to complete all required course work at some future date without payment of any further tuition and fee charges. It is the responsibility of the student to present evidence of his or her activation to the Office of Student Accounts and to request the appropriate refund.

Should a degree student called up for active duty find it necessary to interrupt active pursuit of the degree, he or she may petition the dean for a leave of absence for a specified period of time, generally limited to one calendar year. Deans are encouraged to grant any request to extend the leave of absence for longer than the customary period should military service require an absence of more than one year.

All students on active duty will be automatically exempted from the request for a $50 voluntary library contribution without requiring any communication from them or their initials on the bill.

Right to Change Rules and Programs

The University and its schools and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the

proper authorities may determine. The right is reserved by the University to make changes in programs without notice whenever circumstances warrant such changes.

Right to Dismiss Students

If a student knowingly makes a false statement or conceals material information on an application for admission, registration form, or any other University document, the student's registration may be canceled and the student will be ineligible (except by special action of the faculty) for subsequent registration.

The right is reserved by the University to dismiss or exclude any student from the University or from any class or classes whenever, in the interest of the student or the University, the University Administration deems it advisable.

Property Responsibility

The University is not responsible for the loss of personal property. A Lost and Found Office is maintained on campus in the University Police Office.

Student Conduct

All students upon enrolling and while attending The George Washington University are subject to the provisions of the *Guide to Student Rights and Responsibilities,* which outlines student freedoms and responsibilities of conduct, including the Code of Student Conduct, and other policies and regulations as adopted and promulgated by appropriate University authorities. Copies of these documents may be obtained at the Office of Judicial Affairs. Sanctions for violation of these regulations may include permanent expulsion from the University, which may make enrollment in another college or university difficult. Regulations or requirements applicable only to a particular program, facility, or class of students may not be published generally, but such regulations or requirements shall be published in a manner reasonably calculated to inform affected students.

Students who are charged with violations of the Code of Student Conduct, whether they are found responsible for such charges and/or sanctions apply, must report any and all charges and their disposition to state bar examiners if so required on the bar application form. The Law School will similarly report any charges or sanctions to state bar examiners when the bar certification form requires such a disclosure.

Courses of Instruction

Planning a Balanced Program

After the completion of the required curriculum, J.D. students have a vast domain of courses to choose from at the Law School. The fact that a large number of courses are offered does not mean that all courses have the same importance. Rather, the large curriculum offers students substantial freedom to tailor their programs to their interests and future needs.

The faculty recommends that all students take programs that give them a strong foundation in the standard subject areas of the law. Some students choose to pursue a particular area of the law in special depth or breadth because of career inclinations or for the intellectual values associated with specialized study. The faculty warns students against excessive specialization. It is impossible to foresee future career changes and challenges, and lawyers are not expected by the bar to be specialists when they graduate from law school. The freedom in course selection permitted by the elective policy at the Law School places the responsibility for planning a coherent academic program on the individual student. Students are strongly encouraged to consult with members of the faculty or the administration for guidance on their programs.

Consistent with its commitment to a balanced program, the Law School offers multiple sections of important elective courses every academic year. These multiple-section courses survey the most important subjects in the law and include *Administrative Law* (400), *Antitrust Law* (402), *Commercial Paper–Payment Systems* (282), *Conflict of Laws* (234), *Constitutional Law II* (380), *Corporations* (250), *Creditors' Rights and Debtors' Protection* (284), *Criminal Procedure* (360), *Environmental Law* (430), *Evidence* (230), *Family Law* (348), *Federal Courts* (232), *Federal Income Taxation* (300), *International Law* (520), *International Business Transactions* (522), *Secured Transactions* (280), *Securities Regulation* (252), and *Trusts and Estates* (342). The faculty recommends that J.D. students take a large number of these courses as part of their individual program. Some are prerequisites for specialized courses, clinics, or simulation courses and so should be taken early in a student's course of elective study.

The law faculty also believes that it is important that students understand the relationship between law and other disciplines. History, philosophy, economics, medicine, the social sciences, the humanities, and other fields offer perspectives on the law and the development of legal institutions. Accordingly, the faculty recommends that students take one or more interdisciplinary courses. They include *Art, Cultural Property, and the Law* (488), *Feminist Legal Theory* (608), *Genetics and the Law* (616), *Jurisprudence* (590), *Jurisprudence Seminar* (592), *Law and Anthropology* (612), *Law and Literature* (606), *Law and Medicine* (617), *Law and Psychiatry* (614), *Law and Psychology* (615), *Law and Rhetoric* (654), *Law and Accounting* (602), *Law and Economics* (598), *Law of Race and Slavery* (596), *Quantitative Analysis for Lawyers* (604), *Race, Racism, and American Law* (595), *Sexuality and the Law* (394), and *U.S. Legal History* (591).

The curriculum offers a large variety of clinical courses, simulation courses, and outside placement options in which students have the opportunity to learn lawyering and other advocacy skills in several contexts. These courses permit students to complement the theoretical study of law with experience in interviewing clients, investigating facts, dealing with adverse parties, contacting government agencies, negotiating on behalf of clients and participating in real or hypothetical court and administrative proceedings. The faculty recommends that students take one or more such courses. These courses include *Advanced Advocacy* (653), *Alternative Dispute Resolution* (647), *Civil Litigation Clinic* (624), *Client Interviewing and Counseling* (650), *Consumer Mediation Clinic* (620), *Environmental Law Clinic* (627), *Environmental Crimes Project* (465), *Federal, Criminal, and Appellate Clinic* (625), *Health Law Rights Clinic* (631), *Immigration Clinic* (630), *Inten-*

sive Clinical Placement (638), *International Human Rights Clinic* (633), *Law Students in Court* (634), *Legal Drafting* (652), *Mediation* (646), *Moot Court* (644), *Negotiations* (648), *Outside Placement* (668), *Pre-Trial Advocacy* (643), *Prisoners Project* (376), *Public Justice Advocacy Clinic* (622), *Small Business Clinic* (621), *Trial Advocacy* (640), *Mock Trial Competition* (645), and *Vaccine Injury Clinic* (626).

Career Planning and Course Selection

Every spring a series of counseling sessions is held to provide students with an overview of course offerings in various areas of the law and to assist them in selecting courses and defining their career objectives. Students may also consult members of the faculty for course and career planning. In addition, the Career Development Office provides a central storehouse of information regarding many types of legal careers.

To assist students in choosing upper-class courses and planning graduate programs of study, the Law School's courses are listed below according to principal practice areas, with a brief introduction to the gateway courses in each area. Each listing begins with those basic courses in the practice area that are typically offered in multiple sections, moves next to advanced courses typically offered just once each year, and continues with seminars and clinics related to the practice area. Some courses are listed in several practice areas.

Many courses listed in the course description section of this Bulletin under the headings Law and Other Disciplines (Law 590–617) and Skills and Simulations Courses (Law 640–667) are not repeated in the practice areas listed below. This is because they concern perspectives on the law or lawyering skills that are applicable to all of these practice areas. Students should, therefore, consider taking courses from these categories to complement courses taken within specific practice areas.

Students should consult course descriptions to determine the prerequisites and eligibility criteria.

Practice Areas

Administrative Law and Government Regulation

This large and important field deals with the process by which government regulates the activities of businesses or individuals. *Administrative Law* is the foundation course for all study in this area. Other key survey courses include *Antitrust Law*, *Trademark Law and Unfair Competition*, and *Legislation*. Advanced courses explore the administrative process in the context of a single commercial activity such as health care or the telecommunications industry. Almost all of the courses included in the closely related practice areas of environmental law, government contract law, intellectual property law, labor law, and taxation, which are set out separately in this practice area listing, could fairly be termed species of administrative law and government regulation.

Foundation Courses
Administrative Law (400)
Antitrust Law (402)
Legislation (416)
Trademark Law and Unfair Competition (474)

Advanced Courses
Voting Rights Law (387)
Higher Education Law (389)
Advanced Antitrust Law Seminar (403)
Regulated Industries (406)
Food and Drug Law (408)
Health Care Law (410)
Communications Law (412)
Broadcast and Cable Regulation (413)
Telecommunications Law (414)
Legislative Analysis and Drafting (418)
Campaign Finance Law (419)

Lawyers, Lobbying, and the Law (421)
Congressional Investigations (420)
Local Government Law (422)
Energy Law and Regulation (438)
Law in Cyberspace (485)
Information Privacy Law (486)
Genetics and the Law (616)
Government Lawyering (671)
Health Care Law Seminar (411)
Public Law Seminar (426)
Public Justice Advocacy Clinic (622)
Administrative Advocacy Clinic (632)

Alternative Dispute Resolution

The courses in this area explore the rapidly growing field of dispute resolution outside the courtroom. Lawyers have always resolved most of their clients' disputes without trial, by negotiation and settlement. These courses formally train students in these and related dispute-resolution techniques. *Negotiations, Alternative Dispute Resolution*, and *Mediation* are the foundation for all courses in this area. The remaining courses apply techniques learned in the foundation courses in different contexts.

Foundation Courses
Mediation (646)
Alternative Dispute Resolution (647)
Negotiations (648)

Advanced Courses
Environmental Negotiations (458)
International Arbitration (556)
International Negotiations (558)
Client Interviewing and Counseling (650)
Consumer Mediation Clinic (620)
Health Law Rights Clinic (631)

The following courses are open only to LL.M. degree candidates
Mediation and Alternative Dispute Resolution (676)
Ethics in Adjudication and Settlement (678)
Negotiation and Conflict Management Systems Design (681)
International Dispute Resolution (682)

Advanced Torts

Personal injury and property damage claims are a major part of modern civil litigation. The courses in this practice area all build upon the basic first-year *Torts* course and complete the study of non-contractual private liabilities. *Insurance* deals in part with the process of shifting the risks associated with such liabilities.

Advanced Courses
Complex Litigation (236)
Remedies (238)
Admiralty (293)
Insurance (298)
Products Liability (354)
Toxic Tort Litigation (449)
Genetics and the Law (616)
Law and Medicine (617)
Advanced Torts Seminar (358)
Civil Litigation Clinic (624)
Vaccine Injury Clinic (626)
Domestic Violence Litigation Clinic (628)

Commercial Law

Commercial law regulates the operation of the marketplace, including transactions between businesses and between a consumer and a business. Three courses focus on various portions of the Uniform Commercial Code: *Secured Transactions* (Articles 2A and 9), *Commercial Paper–Payment Systems* (primarily Articles 3, 4, and 4A), and *Creditors' Rights and Debtors' Protection* (state law debt collection and bankruptcy). Advanced courses focus on consumer transactions, the banking industry, and international commercial transactions.

Foundation Courses
Secured Transactions (280)
Commercial Paper–Payment Systems (282)
Creditors' Rights and Debtors' Protection (284)
Banking Law (290)

Advanced Courses
E-Commerce (283)
Consumer Protection Law (286)
Admiralty (293)
Sports Law (295)
Insurance (298)
Entertainment Law (475)
International Business Transactions (522)
International Commercial Law (524)
International Banking (542)
Banking Law Seminar (292)
Commercial Law Seminar (288)
International Business Transactions Seminar (564)
International E-Commerce Seminar (525)
Consumer Mediation Clinic (620)

Constitutional Law and Civil Rights

This major field deals with the proper role of various branches of government and the protection of individual rights and liberties. Building upon the required course on federal powers, *Constitutional Law I*, the courses in this practice area explore the constitutional structure of our federal government and its relationship to the states. A related set of courses addresses the protection of individual civil rights.

Foundation Courses
Federal Courts (232)
Conflict of Laws (234)
Constitutional Law II (380)
Legislation (416)

Advanced Courses
Family, Child, and State (349)
Domestic Violence Law (350)
Counterterrorism Law (383)
Law of Separation of Powers (384)
U.S. Foreign Relations Law (385)
National Security Law (386)
Voting Rights Law (387)
Civil Rights Legislation (388)
Employment Discrimination Law (390)
Gender Discrimination and the Law (392)
Sexuality and the Law (394)
Federal Indian Law (397)
Law of Privacy (398)
Communications Law (412)
Broadcast and Cable Regulation (413)
Lawyers, Lobbying, and the Law (421)
Law in Cyberspace (485)
Immigration Law I (538)
Immigration Law II (539)
History of the U.S. Constitution (594)
Law of Race and Slavery (596)
Disabled People and the Law (635)
Public Interest Lawyering (670)
Constitutional Law and the Supreme Court (395)
Constitutional Law Seminar (399)
Immigration Clinic (630)
Legal Activism (637)
Law and the Deaf (636)

Corporate Law and Securities Regulation

This practice area concentrates on the legal rules governing the formation, organization, financing, and operation of most modern businesses. *Corporations* is both a basic course and a prerequisite to many of the advanced courses in this field. *Securities Regulation* and *Corporate Finance* are other key courses. *Business Planning* offers an opportunity to study corporate, securities, and tax law in a single offering.

Foundation Courses
Corporations (250)
Securities Regulation (252)

Advanced Courses
Corporate Finance (254)
Takeovers and Tender Offers (256)
Regulation of Mutual Funds and Investment Advisers (260)
Agency and Partnership (294)
Business Planning (296)
Corporate Taxation (302)
Advanced Corporate Taxation (303)
Partnership Taxation (304)
Nonprofit Organizations: Law and Taxation (314)
Law and Accounting (602)
Corporation Law Seminar (262)
Securities Law Seminar (264)
Small Business Clinic (621)

Criminal Law and Procedure

Building upon the required course on substantive criminal law, the courses in this practice area explore the rules governing criminal procedure, the sociology of crime, and the application of the criminal law to particular conduct, such as environmental crimes and the use of drugs. The survey course, *Criminal Procedure*, is the starting point for study in this area.

Foundation Course
Criminal Procedure (360)

Advanced Courses
Comparative Military Law (244)
Adjudicatory Criminal Procedure (362)
White Collar Crime (364)
Law and Criminology (366)
Computer Crime (369)
Forensic Science (370)
Drugs and the Law (372)
Counterterrorism Law (383)
Environmental Crimes (464)
International Criminal Law (554)
Criminal Law and Procedure Seminar (379)
Prisoners Project (376)
Environmental Crimes Project (465)
Law Students in Court (634)

Environmental Law

The basic course in environmental law surveys in general terms the wide variety of federal statutes regulating activity affecting the environment. A broad range of specialized courses focus on particular federal laws regulating particular resources or industries.

Foundation Course
Environmental Law (430)

Advanced Courses
Regulated Industries (406)
Air Pollution Control (432)
Environmental Law Enforcement (433)
Water Pollution Control (434)
Trade and Sustainable Development (435)
Water Resources Law (436)
Coastal, Navigation, and Wetlands Resource Law (437)
Energy Law and Regulation (438)
Environmental Issues in Energy Law (439)
Natural Resources Law (440)
Regulation and Management of Ecosystems (441)
Control of Solid and Hazardous Wastes (RCRA & CERCLA) (442)
Toxic Tort Litigation (449)
Federal Facilities Environmental Law Issues (450)
Environmental Issues in Business Transactions (452)
International Environmental Law (454)
Environmental Planning (456)
Sustainable Regional Growth Seminar (457)
Environmental Negotiations (458)
Environmental Compliance and Enforcement Mechanisms (463)
Environmental Crimes (464)
Animal Law and Wildlife Protection Seminar (424)
Environmental Law Seminar (466)
Government Contracts and Environmental Law Seminar (507)
Environmental Crimes Project (465)
Environmental Legislation Project (467)
Graduate Environmental Placement (468)
Environmental Law Clinic (627)

Family Law and Estate Planning

This cluster of courses investigates the role of the law in family matters and the inheritance of wealth.

Foundation Courses
Trusts and Estates (342)
Family Law (348)
Family, Child, and State (349)

Advanced Courses
Wealth Transfer Taxation (306)
Estate Planning (346)
Domestic Violence Law (350)

Elder Law (353)
Gender Discrimination and the Law (392)
Sexuality and the Law (394)
Transnational Family Law (533)
Feminist Legal Theory (608)
Family Law Seminar (352)
Civil Litigation Clinic (624)

Government Contract Law

The courses in this practice area explore the body of rules regulating the process by which the federal government enters into contracts with private parties and oversees the performance of those contracts. *Government Contracts* is a survey course for those seeking a general overview of the law in this area. Students preferring a longer course of study may choose instead the *Formation of Government Contracts* and *Performance of Government Contracts* sequence.

Foundation Course
Government Contracts (500)

Advanced Courses
Formation of Government Contracts (502)
Performance of Government Contracts (503)
Government Contracts Cost and Pricing (506)
Government Contracts and Environmental Law Seminar (507)
Comparative Public Procurement (508)
Government Contracts Seminar (509)
Graduate Government Contracts Placement (510)

Intellectual Property

This growing practice area concerns the development and protection of intangible ideas and property. The principal survey courses are *Intellectual Property, Trademark Law and Unfair Competition*, *Copyright Law*, and *Patent Law*. A related course is *Antitrust Law*.

Foundation Courses
Intellectual Property (470)
Patent Law (471)
Copyright Law (472)
Trademark Law and Unfair Competition (474)
Antitrust Law (402)

Advanced Courses
Computer Crime (369)
International Copyright Law (473)
Entertainment Law (475)
Patent Strategies and Practice (476)
The Federal Circuit (477)
Licensing of Intellectual Property Rights (478)
Intellectual Asset Management (479)
Chemical and Biotech Patent Law (480)
Patent Enforcement (482)
Patent Appellate Practice (483)
Computer Law (484)
Law in Cyberspace (485)
Information Privacy Law (486)
Art, Cultural Property, and the Law (488)
International and Comparative Patent Law (490)
Genetics and the Law (616)
Intellectual Property Antitrust Seminar (494)
Intellectual Property Law Seminar (496)
Law, Science, and Technology Seminar (462)

International Law

These courses explore the international and domestic laws that regulate or influence international activity among countries, international institutions, businesses, and individuals. The two key survey courses are *International Law* and *International Business Transactions*. The remaining advanced courses focus on a wide range of issues in both public and private international law as well as the domestic law of other countries.

Foundation Courses
International Law (520)
International Business Transactions (522)

Advanced Courses
International Taxation I (312)
International Taxation II (313)
International Commercial Law (524)
International Trade Law (526)
Advanced International Trade Law (527)
International Litigation (528)
International Labor Standards and the Global Economy (529)
International Organizations (530)
International Judicial Assistance (531)
Comparative Law (532)
Transnational Family Law (533)
Law of the European Union (534)
Islamic Law (535)
Law of Japan (536)
Traditional Jewish Civil Law (537)
Immigration Law I (538)
Immigration Law II (539)
Refugee and Asylum Law (540)
Introduction to Chinese and Japanese Law (541)
International Banking (542)
Law of the People's Republic of China (543)
Foreign Direct Investment (544)
International Law of Human Rights (546)
Law of the Sea (550)
International Law of Territory and Territorial Disputes (551)
Law of War (552)
U.S. Export Control Law and Regulation (553)
International Criminal Law (554)
International Arbitration (556)
International Negotiations (558)
Human Rights Lawyering (568)
Conflict of Laws (234)
Admiralty (293)
Law of Separation of Powers (384)
U.S. Foreign Relations Law (385)
National Security Law (386)
Trade and Sustainable Development (435)
International Environmental Law (454)
Comparative Public Procurement (508)
International E-Commerce Seminar (525)
International Project Finance (545)
Regional Protection of Human Rights (547)
Nuclear Non-proliferation Law and Practice (560)
Public International Law Seminar (562)
Trade Remedy Law (563)
International Business Transactions Seminar (564)
Comparative Law Seminar (565)
Human Rights Advocacy Seminar (567)
Immigration Clinic (630)
International Human Rights Clinic (633)

Labor and Employment Law

This field of law deals with all aspects of the employment relationship. The key survey courses are *Labor Law*, which covers the organization and representation of employees through unions, and *Employment Law*, which explores the rights and responsibilities of workers. Advanced courses focus on other legal rules that apply in the workplace or affect the employer/employee relationship.

Foundation Courses
Labor Law (266)
Employment Law (268)

Advanced Courses
Employee Benefit Plans (272)
Agency and Partnership (294)
Sports Law (295)
Employment Discrimination Law (390)
Gender Discrimination and the Law (392)
International Labor Standards and the Global Economy (529)
Labor and Employment Law Seminar (276)

Litigation and the Judicial Process

Courses in this area examine the procedural and remedial rules that regulate civil and criminal litigation in our state and federal courts. Building upon the required

Civil Procedure I and *II* sequence, the key survey courses in this area are *Criminal Procedure*, *Evidence*, *Federal Courts*, *Conflict of Laws*, and *Remedies*. Related simulation courses include *Trial Advocacy*, *Federal Trial Practice*, and *Moot Court*.

Foundation Courses
Evidence (230)
Federal Courts (232)
Conflict of Laws (234)
Remedies (238)
Criminal Procedure (360)

Advanced Courses
Complex Litigation (236)
Comparative Military Law (244)
Appellate Practice (246)
Admiralty (293)
Insurance (298)
Products Liability (354)
Adjudicatory Criminal Procedure (362)
Role of the Federal Prosecutor (363)
Toxic Tort Litigation (449)
The Federal Circuit (477)
Pre-Trial Advocacy (643)
Advanced Appellate Advocacy (653)
Law and Rhetoric (654)
The Craft of Judging (669)
Government Lawyering (671)
Scientific Evidence Seminar (248)
Civil Procedure Seminar (249)
Professional Responsibility and Ethics Seminar (593)
Civil Litigation Clinic (624)
Federal, Criminal, and Appellate Clinic (625)
Vaccine Injury Clinic (626)
Law Students in Court (634)

The following courses are open only to LL.M. degree candidates
Advanced Trial Advocacy (675)
Pre-Trial Practice in Civil Cases (677)
Ethics in Adjudication and Settlement (678)
Advanced Evidence (679)
The American Jury (680)
College of Trial Advocacy (683)
Pre-Trial Practice in Criminal Cases (684)

Property and Land Development

Building upon the required course *Property*, this practice area concerns the process of developing real estate for residential and commercial use. The key survey course is *Modern Real Estate Transactions*, with subsequent courses addressing the administrative, governmental, and tax issues attending the real estate industry.

Foundation Course
Modern Real Estate Transactions (330)

Advanced Courses
Law of Real Estate Financing (334)
Housing Rights Law (338)
Partnership Taxation (304)
Agency and Partnership (294)
Property and Real Estate Seminar (340)

Taxation

Federal Income Taxation examines the fundamental rules controlling the taxation of individuals and serves as the gateway course to all of the other subjects in this practice area. The remaining courses explore the taxation of other entities, such as corporations and partnerships, the taxation of wealth transfers, and the tax rules applicable to particular transactions or industries.

Foundation Courses
Federal Income Taxation (300)
Corporate Taxation (302)

Advanced Courses
Advanced Corporate Taxation (303)
Partnership Taxation (304)
Wealth Transfer Taxation (306)
Pension Law and Taxation (307)
International Taxation I (312)
International Taxation II (313)
Nonprofit Organizations: Law and Taxation (314)
State and Local Taxation (316)
Business Planning (296)
Employee Benefit Plans (272)
Law and Accounting (602)
Quantitative Analysis for Lawyers (604)
Tax Policy Seminar (318)

Course Descriptions

The courses of instruction are described below. The number of hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, an academic-year course with two hours of credit each semester is marked (2–2) and a semester course with two hours of credit is marked (2). Some courses are offered for variable credit hours and are marked (2 or 3) or (3 or 4). Each semester's class schedule will indicate the number of hours for which the course is being offered.

The method by which students will be evaluated in the course is indicated at the end of each course description. See Method of Evaluation under Academic Evaluation, Juris Doctor Degree and Master of Laws Degree. Not all courses are offered each year. Students should consult the schedule of classes to determine whether a course is offered in any given semester or summer session.

Required Courses for J.D. Students

202–3 Contracts I–II (3–3 day) (4–2 evening) Kovacic, Schooner, Selmi, Wilmarth, Bishop

Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, problems of proof; function of consideration; conditions; assignments; third-party beneficiaries; effect of changed circumstances; protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, adversary method. (Examination)

206 Torts (4) Suter, Turley, Lewyn

Liability for harm to person or property. Intentional torts, negligence, nuisance, products liability, defamation, and invasion of privacy; fault and other bases for shifting losses; causation; damages; effects of liability insurance; problems under Federal Tort Claims Act. (Examination)

208 Property (4) Nunziato, Overton, Tsuk, Tuttle, Lewyn

Basic concepts of personal property. Real property: historical background of the law of estates and conveyancing, types of estates, dower and curtesy, landlord and tenant relationship, concurrent estates, future interest at common law and after the Statute of Uses; introduction to modern conveyancing—the real estate contract, the deed, the recording system, methods of title assurance. (Examination)

210 Criminal Law (3) Butler, Cottrol, Kerr, Lawrence, Lee, Sirulnik, Solove

An overview of the criminal justice system; dimensions of the problem of crime and goals of penal sanctions. An examination of what conduct should be made criminal and what sanctions should be applied. The theoretical anatomy of a criminal offense (elements of *mens rea* and *actus reus*), the general principles of criminal liability, and the various defenses. Special problems, such as conspiracy, inchoate crimes, causation, insanity, and complicity, are subjected to detailed analysis. (Examination)

212–13 Civil Procedure I–II (3–3 day) (4–2 evening) Clark, Colby, Friedenthal, Molot, Peterson, Raven-Hansen, Schaffner, Siegel, P. Smith, Trangsrud, Tyler

The theory and practice of civil litigation. Analysis of the goals, values, costs, and tensions of an evolving adversarial system of adjudication. Examination of the rules and statutes that govern the process by which substantive rights and duties are enforced in our federal and state courts. Topics include the relationship of procedure to substantive law, the proper reach of judicial authority, pleading, motions practice, joinder of parties and claims, class actions, pretrial discovery, trial by jury, remedies, post-trial procedure, appeals, claim and issue preclusion, and alternative dispute resolution. (Examination)

214 Constitutional Law I (Federal Systems) (3) Barron, Cheh, Clark, Colby, Maggs

Basic principles of U.S. constitutional law, with a focus on governmental powers and the role of the Supreme Court in interpreting and enforcing constitutional

norms. The nature and scope of judicial review. The case and controversy requirement and other limitations on constitutional adjudication. Powers of the president and Congress; the separation of powers doctrine. Relationship of the national government to state governments and principles of federalism. The state action doctrine. (Examination)

216 Legal Research and Writing (2) DeSanctis and Staff
Introduction to use of a law library; research experience in primary, secondary, and specialized sources of law; practice in proper legal citation form. Instruction and practice in legal writing and analysis, with primary emphasis on legal memoranda. The grade of *H*, *P*, *LP*, or *NC* is given for this course. Failure to complete the work in this course will result in a grade of *F*.

217 Introduction to Advocacy (2) DeSanctis and Staff
Instruction and experience in the research and writing of pretrial motions and appellate briefs, with emphasis on preparing and presenting arguments persuasively. Also instruction and practice in preparing and presenting oral arguments. The grade of *H*, *P*, *LP*, or *NC* is given for this course. Failure to complete the work for this course will result in a grade of *F*.

218 Professional Responsibility and Ethics (2 or 3) Gabaldon, Lee, T. Morgan, Tuttle, Hamilton, Burger, Bycel
Ethical problems involved in civil and criminal counseling and litigation. Rules of Professional Conduct and legal discipline; roles of bar associations and courts in regulating lawyer conduct. (Examination)

Courts and Civil Litigation

230 Evidence (3 or 4) Friedenthal, Pierce, Saltzburg, Kirkpatrick, Dorsen, Gilligan
Policies, principles, standards, and rules governing the trial of civil and criminal cases in federal and state courts. Topics may include relevancy, the hearsay rule, direct and cross examination of witnesses, opinion, scientific evidence, impeachment, privileges, writings, real and demonstrative evidence, judicial notice, confrontation and compulsory process, and burdens of proof and presumptions. (Examination)

232 Federal Courts (3) Siegel, Tyler
The relationship of the federal courts to Congress and to the states. Topics may include judicial review; standing and justiciability; congressional power to regulate jurisdiction; legislative courts; federal question, diversity, removal, civil rights, and habeas corpus jurisdiction; state sovereign immunity; Supreme Court appellate jurisdiction; abstention; federalism doctrines; and federal common law. (Examination)

234 Conflict of Laws (3) Lerner, Steinhardt
Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, business associations. (Examination)

236 Complex Litigation (3) Trangsrud
Analysis and critique of complex civil litigation in the state and federal courts. Examination of complex joinder, the management of factually related claims in multiple venues, modern class-action practice, and current developments in the law of claim and issue preclusion. Other topics covered in some years include judicial supervision of plaintiff and defendant class actions; discovery and judicial control of large cases; the role of juries, magistrates, and masters in complex cases; and problems attending complex remedies such as the use of structural injunctions to reform public schools, hospitals, and prisons. (Examination)

238 Remedies (3) Schaffner
The types and forms of relief that judges can award in civil litigation: decisional and statutory damages in contract, quasi contract, and tort, including tort reform and wrongful death; overcoming limitations of actions and releases; injunctions as provisional and final relief; equitable remedies, such as specific performance, recission, and reformation; relief from fiduciaries; and tracing, constructive trusts, and equitable liens. (Examination)

240 Litigation with the Federal Government (3) Axelrad
Major substantive aspects of litigation with the federal government. Topics include analysis of statutory schemes that permit and limit judicial remedies against federal agencies and officials; nonstatutory remedies; judicial review; monetary recoveries from the United States; special rules, including those pertaining to discovery and application of equitable principles; and consideration of the continued vitality of federal sovereign immunity. (Examination)

244 Comparative Military Law (2) Gilligan
Analysis and critique of the broad concept of a separate military justice system; similarities between rules of evidence and rules of criminal procedure in the military and civilian systems; the role of Congress in overseeing the military criminal system; application of the First, Fourth, Fifth, and Sixth Amendments to service members; and broad policy issues such as the systemic challenges to the military justice system. (Examination or research paper with permission of the instructor)

246 Appellate Practice (2) Yukins
The philosophy and mechanics of the appellate process. The interplay or tension between procedural and substantive law, fact and law, merit and advocacy, deference and fairness, and the effect of these factors on the disposition of individual appeals and the clarification of law by appellate courts. (Research paper)

248 Scientific Evidence Seminar (2) Blackmon
The use of scientific methods and the reliability of scientific principles in litigation. Topics include statistical proof, surveys, and epidemiological principles. Exploration of the admissibility and sufficiency of expert scientific testimony and evidence in light of recent Supreme Court cases, and application of these principles to lower court cases. Prerequisite: Law 230. (Research paper)

249 Civil Procedure Seminar (2)
Selected topics in civil procedure to be announced at the time of registration. Enrollment is limited. (Research paper)

Commercial, Business, and Labor Law

250 Corporations (4) Clarke, Gabaldon, Mitchell, Tsuk, Wilmarth, Bishop
Corporate law, with emphasis on operations and financing of corporations. Control of corporations, action by corporate directors, officers, shareholders. Control devices. Directors' and shareholders' duties of care and loyalty, insiders' transactions in shares of the corporation. Derivative suits, kinds of shares, dividends, corporate distributions. (Examination)

252 Securities Regulation (3) Gabaldon
Survey of federal and state laws governing the offering, distribution, and trading of securities. Focus on federal laws and regulations, in particular the Securities Act of 1933, the Securities Exchange Act of 1934, and the enforcement of these laws by the SEC and private parties. Prerequisite: Law 250. (Examination)

254 Corporate Finance (2 or 3) Mitchell
General introduction to finance theory; problems in the issuance and reacquisition of corporate securities; analysis of various types of securities; problems involved in the use of debt and payment of corporate dividends; and financial analysis of mergers, acquisitions, recapitalizations, dissolutions, and liquidations. Prerequisite: Law 250. (Examination)

256 Takeovers and Tender Offers (2) Krus
Federal and state regulation of corporate takeover bids and tender offers, including theories of corporate acquisitions, the Williams Act, and regulation of takeover tactics and defenses. Prerequisite: Law 250. (Examination)

260 Regulation of Mutual Funds and Investment Advisers (2) Ragen
Applicability of the Investment Company Act of 1940 to particular business activities that may bring an entity within the statutory definition of investment company; litigation as to fees; policy considerations relating to front-end loads; SEC regulations regarding advertising and promotion; restrictions on activities by affiliates; and current SEC disclosure requirements. Applicability of the Investment Advisers Act of 1940 to activities of individuals and entities; procedures for compliance; First Amendment issues raised by SEC enforcement actions; and civil

liability under the antifraud provisions of the securities laws. Recommended: prior or concurrent enrollment in Law 250 and 252. (Examination or research paper with permission of the instructor)

262 Corporation Law Seminar (2) Solomon
Analysis of the nature and role of the business corporation in the U.S. and transnational political economy; evolution of the corporation and the political economy; impact of technological change on the corporation and the political economy; reasons for and consequences of the growth of large corporate enterprises; role of entrepreneurs in the political economy; relationship of corporations to the government and other centers of power. (Research paper)

264 Securities Law Seminar (2)
Selected topics in corporate and securities law practice and theory to be announced at the time of registration. Enrollment is limited. Prerequisite: Law 250. (Research paper)

266 Labor Law (2 or 3) Craver, Freilicher
Law governing labor–management relations, organizations and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intra-union relations. (Examination)

268 Employment Law (2 or 3) Datz, Munro
Individual rights and obligations in employment; survey of common law and statutory regulation of the individual employment relationship from its inception to its termination; emphasis on current developments such as wrongful discharge, medical screening, employer-provided health insurance and child care, occupational safety and health, workers' compensation, and retirement issues. (Examination or take-home examination)

272 Employee Benefit Plans (2) Mackiewicz, Quinn
Pre-ERISA benefit plans, the federal labor law governing those plans, and the conditions which led to the passage of ERISA and its effect on Taft-Hartley plans. Practical realities of collectively bargained benefit plans; preemption of state law and interplay of various federal laws; roles played by union and employer both in the context of individual bargaining of employee benefits and in the context of the employer and the union as trustee of a benefit plan; rights of participants and beneficiaries under the plan and under the collective bargaining agreement; rights and obligations of contributing employers; and termination and withdrawal issues, including plant shutdowns and bankruptcies. (Take-home examination)

276 Labor and Employment Law Seminar (2)
Selected topics in labor and employment law to be announced at the time of registration. Enrollment is limited. (Research paper)

280 Secured Transactions (2 or 3) Zubrow
Survey of the law governing asset-based financing involving business and consumer debtors with emphasis on Article 9 of the Uniform Commercial Code. Structure of credit transactions involving personal property collateral, resolution of priority disputes among creditors and other claimants over tangible and intangible property, and the means by which secured creditors collect from debtors upon default. The use of streams of future revenue in securitizations and of stock and bonds as collateral. (Examination)

282 Commercial Paper—Payment Systems (2 or 3) Maggs
Classic view of negotiable instruments as codified by Article III of the Uniform Commercial Code. Check collection: the system in theory as expressed in Article IV of the Uniform Commercial Code and the system in practice; Federal Reserve regulations, Clearing House agreements, and automation systems. The dual banking system, work of the Comptroller General and the Federal Reserve Board. Legal problems concerning interest and the checkless society. (Examination)

283 E-Commerce (2) Burr, Jain
U.S. law affecting electronic commerce. Formation and terms of electronic contracts; voluntary compliance with regulations by e-merchants; mass marketing and consumer protection; payment on the Internet and cybercash; the jurisdiction of private parties to sue and of public authorities to regulate e-merchants; privacy; and intellectual property and taxation issues. Credit may not be earned for both Law 283 and 525. (Examination)

284 Creditors' Rights and Debtors' Protection (3 or 4) Galston
Creditors' remedies and debtors' protections under state law: writs of attachment, garnishment and execution, acquisition of liens and forced sales of property, self-help arrangements, and security agreements. Bankruptcy under federal law: who may file, the creation and administration of the bankruptcy estate, powers of the trustee, discharge of debt; rehabilitation plans for individuals under Chapter 13. (Examination)

286 Consumer Protection Law (3) T. Schwartz
Common law doctrines and Federal Trade Commission case law and a variety of federal and state statutes and regulations thereunder. Statutes to be considered include Truth in Lending, Fair Credit Billing, Equal Credit Opportunity, Fair Debt Collection Practices, Magnuson–Moss Warranty Acts, Uniform Commercial Code provisions applicable to consumer sales and transactions, unfair trade practice laws, usury laws, and automobile "lemon" laws. Comparison of regulatory and remedial techniques available through case law, general statutory provisions, and specifically targeted technical statutes; public and private enforcement mechanisms, including litigation and alternative dispute resolution. (Examination or research paper with permission of the instructor)

288 Commercial Law Seminar (2)
Selected topics in commercial law to be announced at the time of registration. Enrollment is limited. (Research paper)

290 Banking Law (3) Buchman
Federal regulation of the financial services industry, especially commercial banks. Includes an analysis of the Federal Deposit Insurance Corporation as insurer of deposits, receiver, and liquidator of troubled banks; the role of the Comptroller of the Currency as the primary federal regulator of national banks, including the chartering function, bank examinations, analysis of classified loans, capital adequacy, and enforcement of substantive federal legislation; operation of the Federal Reserve System under the Bank Holding Company Act and the various substantive regulations such as Reg. B (equal credit opportunity), Reg. J (check collection), Reg. M (consumer leasing), Reg. Q (deposit rate regulation), Reg. O (insider loan limits), Reg. E (electronic funds transfer), and Reg. Z (truth in lending); geographic deregulation and the trend toward interstate banking; and an analysis of financial services product deregulation and unification of the industry along functional lines. (Examination)

292 Banking Law Seminar (2)
Selected topics in banking law to be announced at the time of registration. Enrollment is limited. (Research paper)

293 Admiralty (3) Kenney
The maritime law applied in federal and state courts; admiralty jurisdiction and practice; litigation and arbitration; making uniform law by international convention. The U.S. law of seamen, shoreside workers, and personal injury and death in navigable waters; maritime liens and ship mortgages; carriage of goods by water; collisions at sea; salvage, general average, and limiting liability for private damage and environmental harms. (Examination)

294 Agency and Partnerships (2) Wyrsch
Employment relations, vicarious liability of employers for employees' torts, scope of employment, and independent contractors; agents' authority and apparent authority to contract for their principals; ratification; nonprofit associations; the formation, operation, and termination of partnerships; limited partnerships. (Examination)

295 Sports Law (2 or 3) Falk
Survey of sports regulation as it affects amateur and professional athletes. Topics include the NCAA regulatory structure; agent regulation; and legal representation of professional athletes in contract negotiation with sports franchises and in other contexts. (Research paper and class projects)

296 Business Planning (2 or 3) T. Cooney, Eule, Press
Integrated study of corporate, tax, accounting, and securities law aspects of the following: choice and formation of a closely-held business entity; structure of equity and control of a corporate entity; providing for changes in stock ownership; providing for the mid-life of a corporation, including buy-outs and recapitalizations; and analysis formulation of planning for a corporate acquisition.

Analysis of hypothetical problems and practical solutions and insights into the practice of the business lawyer. Prerequisite: Law 250 and 300. Law 302 or equivalent is recommended. Enrollment is limited. (Problem assignments)

298 Insurance (2) Johnston, Klein, Mayerson, McMinn
A primary risk-distributing medium and the rules by which legislative, administrative, and judicial bodies seek to promote its benefits and avert its dangers. Insurance marketing, insurable interest, subrogation, transfer of insurance benefits to nonpolicyholders, coverage and other insurance policy provisions, disposition of claims. (Examination)

Taxation

300 Federal Income Taxation (3 or 4) Brown, Halpern
Survey of substantive provisions of federal income tax law, including concept of gross income, provisions affecting taxation of family and individual transactions, limitations on allowable deductions, sales and dispositions of property, problems of capital gains taxation, nontaxable exchanges. (Examination)

302 Corporate Taxation (3) Block, Serbes, Vogel
Continuation of Law 300. Primary emphasis on corporate–shareholder relationships. Problems of corporate dividends, redemptions of stock, stock dividends, bail-outs, and dividends in kind. Federal income tax problems involved in the formation of corporations, the sale of corporate businesses (including collapsible corporations), mergers and acquisitions, and corporate divisions. Prerequisite: Law 300. (Examination)

303 Advanced Corporate Taxation (2 or 3)
Consideration of the impact on the corporation, shareholders, and bondholders of tax-free and taxable corporation reorganizations. Focus on acquisitive reorganizations, rearrangements of capital structure, divisive reorganizations, and the related judicial and statutory requirements. Also considered are liquidation-reincorporations, carryover of corporate attributes to the new entity, carryover or carryback of net operating losses, and affiliated corporations issues. Prerequisite: Law 302. (Examination)

304 Partnership Taxation (2 or 3) M. Sanders
Income tax problems of partnerships, limited liability companies, and S corporations (Subchapters K and S of the Internal Revenue Code), including a comparison of the advantages, disadvantages, and differences among three types of pass-through entities. Practice-oriented study of partnerships, including syndication, organization, and structure of entity, with emphasis on policy examination of areas of IRS principal concern, including disproportionate tax allocations, guaranteed payments to partners, contributions of capital, basis for gain or loss, passive activity losses, non-recourse financing, current and liquidating distributions, sale of partnership interests, collapsible partnerships, termination, special basis adjustments, and distributions to retiring or deceased partners. Planning-oriented analysis of Subchapter S, including procedures for electing and terminating Subchapter S status, treatment of income and losses, limitations on deductibility of losses, and avoiding common pitfalls. Prerequisite: Law 300; recommended: Law 302. (Examination)

306 Wealth Transfer Taxation (2 or 3) Nudelman
Survey of substantive provisions of wealth transfer taxation reflecting the changing climate of federal taxation in the area of estate, gift, and income taxation, including transfers to trusts; individual, joint, and entity ownership of property; the consequences of powers of appointment or retained interest in gifted property; inter-spousal and intra-family transfers; and the application of credits and deductions to the tax picture. Prerequisite or concurrent registration: Law 300. (Examination and drafting assignments)

307 Pension Law and Taxation (2)
Survey of the structure and operation of tax-qualified pension, profit sharing, and stock-bonus plans under X401(a) of the Internal Revenue Code. Requirements for obtaining and maintaining IRS approval. (Examination)

312 International Taxation I (2 or 3) Brown
Federal income tax law and policy regarding foreign persons with business and investment activities in the United States ("inbound foreign investment"). Topics include jurisdiction to tax, status as foreign or U.S. taxpayer, source of income

and deduction apportionment rules, withholding taxes, tax treaties and anti-treaty-shopping rules, disposition of U.S. real property by foreign taxpayers, branch profits tax, and an introduction to foreign tax credit issues. When Law 313 is not offered during an academic year, this course may also cover foreign tax credit issues, anti-income deferral rules, tax havens, and special foreign earned income rules. Prerequisite: Law 300 or permission of the instructor. (Examination)

313 International Taxation II (2) Brown
Federal income law and policy regarding U.S. persons with business and investment activities abroad ("outbound foreign investment"). Topics include advanced foreign tax credit issues, anti-income-deferral rules, international sale of goods, licensing of intellectual and other property, transfers of property to related and unrelated parties, treaty issues, international joint ventures, and foreign currency rules. Prerequisite: Law 312. (Examination)

314 Nonprofit Organizations: Law and Taxation (2) Galston
Charities and other nonprofits as regulated by both federal and state laws. Tax status of nonprofits, fiduciary standards applicable to their officers and directors, liability laws for nonprofits and their volunteers, and enforcement questions. The lobbying and political activities of nonprofits, their commercial activities and the related charge of unfair competition, the extent to which nonprofits are subsidized, the justification for subsidizing them, and standing issues. Enrollment may be limited. Prerequisite: Law 300. (Examination or research paper with permission of the instructor)

316 State and Local Taxation (2) Brunori
Taxation by state and local governments; problems of real and personal property taxation, sales and use taxes, business and personal income taxes. Limitations on taxation of interstate commerce. Congressional problems. (Take-home examination or research paper with permission of the instructor)

318 Tax Policy Seminar (2) Block
Intensive study of selected aspects of the tax structure with primary attention given to the federal income tax. Problem areas are reviewed primarily from the standpoint of tax policy, including legal, economic, social, and practical considerations. Alternative solutions, including current legislative proposals, are examined. Enrollment is limited. Prerequisite: Law 300. Recommended: Law 302. (Research paper)

Property, Family Law, and Torts

330 Modern Real Estate Transactions (3) K. Schwartz
Basic course in conveyancing. Current problems in purchase and sale of residential real estate; legal and equitable rights, responsibilities, liabilities, and remedies of buyer, seller, broker, escrow agent, conveyancing attorney, title examiner, abstractor, and lender; interim and permanent mortgage finance, discounts, points, "subject-to" and "assumptions," remedies on default, including foreclosure processes; process of examination and assurance of title and other interests in realty, including recording and title insurance systems; settlements and closings, warranties of title, encumbrances on title, and clearing of title; emerging problems related to cooperatives, condominiums, and property owners associations. (Examination)

332 Land Use Law (2) Feola, L. Gordon, Silber
Problems, solutions, emerging concepts, and constitutionality of land use regulations, including zoning, subdivisions, historic preservation, exactions, vested rights, transfer of development rights, growth management, and urban and regional planning. (Writing assignments and examination)

334 Law of Real Estate Financing (2) Ginsburg, Stuart
Types of lenders, choice of entity, construction loans, permanent financing; lenders' obligations, remedies, and liabilities; title insurance, survey, and liens; ground lease and commercial lease/leasehold mortgage; joint ventures; alternate capital formation; opinion letters. (Examination)

338 Housing Rights Law (2)
Housing rights of low-income persons, including tenant rights in landlord–tenant courts. Review of litigation strategies to address systemic violations of

housing rights, such as racial and other forms of discrimination in the provision of shelter, housing, and neighborhood revitalization. (Research paper and writing assignments)

340 Property and Real Estate Seminar (2)
Selected topics in property and real estate law to be announced at the time of registration. Enrollment is limited. (Research paper)

342 Trusts and Estates (3 or 4) Cahn, W. Davis, Edmisten, Hall, Palmer
Noncommercial transfers of wealth at death or during life; essential elements and formalities for creation of trusts and execution of wills, revocation and alteration, grounds for contest, limits on property owner's power to control, intestate succession. (Examination and problem assignments)

346 Estate Planning (2) Nudelman
Effective acquisition, management, and disposition of wealth by lifetime transactions and testamentary transfer. Emphasis on federal income, estate, gift, and generation-skipping transfer taxation. Problem assignments address probate avoidance, interspousal transfers, jointly owned assets, transfers to minors, irrevocable trusts, closely held family and business interests, post-mortem estate planning, retirement planning, and charitable giving. Enrollment is limited. Prerequisite: Law 342. (Drafting assignments)

348 Family Law (2 or 3) Cahn, Ross
Survey of family law, including statutory law of domestic relations and constitutional restraint on state regulation of the family. Topics include marriage, divorce (including child custody, property division, alimony, and child support), domestic violence, reproductive rights, and family privacy. The course draws on historical and interdisciplinary materials and involves discussion of public policy issues as well as current law. (Examination)

349 Family, Child, and State (2 or 3) Ross
The allocation of power and responsibility among parent, child, and state. Freedoms under the First Amendment, education, health care including procreation, child abuse and neglect, custody, adoption, and juvenile delinquency. Sociological/psychological perspectives on the parent–child relationship. Enrollment is limited. (Examination)

350 Domestic Violence Law (2 or 3) Jackson
Historical perspective on legal and public policy approaches to domestic violence; contemporary civil and criminal justice systems approaches to domestic violence; and analysis of relevant federal and state laws. (Research paper)

352 Family Law Seminar (2) Ridder
Historical and contemporary problems in the theory and practice of family law. Specific topics to be announced. Enrollment is limited. Prerequisite: Law 348 or 349. (Examination or research paper with permission of the instructor)

353 Elder Law (2 or 3) Hurme, Schuster
Topics may include Medicare and Medicaid, financing health care, and related policy issues; health care decision making, including informed consent and advance health care directives; issues related to the right to die, including euthanasia and doctor-assisted suicide; long-term health care issues, including nursing homes and other alternatives, insurance, monitoring, and quality of services; guardianships and other procedures in the event of age-related disabilities; Social Security and Supplemental Security Income; housing issues, including tax incentives, retirement communities, and continuing care facilities. (Examination)

354 Products Liability (2 or 3) T. Schwartz
Theory and practice of product liability litigation. Compensatory and punitive damages; competing strategies pursued by plaintiffs and defendants. Affirmative defenses and defense strategies. Failure-to-warn and defective design cases. Discovery techniques. Settlement strategy and mediation of product liability cases. Class actions and multidistrict litigation involving defective products. Differences between U.S. product liability litigation and other countries' systems. (Examination or research paper with permission of the instructor)

358 Advanced Torts Seminar (2)
Selected topics in torts law to be announced at the time of registration. Enrollment is limited. (Research paper)

Criminal Law and Procedure

360 Criminal Procedure (3 or 4) Cheh, Kerr, Lerner, Rosen, Saltzburg, Fairfax

Comprehensive presentation of major issues in criminal process, with emphasis on Supreme Court cases interpreting the Constitution. The course proceeds through the criminal justice system, from first police contact, search interrogation, and other investigation, through the prosecution, preliminary proceedings, and trial. Problems of federalism, the exclusionary rule, and sentencing. (Examination)

362 Adjudicatory Criminal Procedure (2 or 3) Fairfax, Starrs

Sources of Rules of Criminal Procedure, bail, preliminary hearing, the decision to prosecute; the grand jury; discovery; voir dire; motions practice; capital punishment; collateral remedies; and sentencing. Credit may not be earned for both Law 362 and Law 363. (Examination)

363 Role of the Federal Prosecutor (2) Cassibry, S. Robinson

Exploration of the responsibilities and powers of the federal prosecutor. The effect of legal, ethical, policy, and practical considerations on the prosecutor's decision making throughout various stages of the criminal justice system. The potentially competing interests of federal, state, and foreign jurisdictions in investigation and prosecution of criminal activity. Classes are held at the Department of Justice. Enrollment is limited and includes students from other area law schools. Credit may not be earned for both Law 363 and Law 362. (Take-home examination)

364 White Collar Crime (2 or 3) Casino, Eliason

Definition, prosecution, and sanctioning of federal corporate and white collar crime offenses. Examination of special problems in the prosecution and the defense of such offenses. Exploration of primary white collar offenses in the federal system, e.g., mail and wire fraud, securities fraud, insider trading, bribery of public officials, and environmental crimes. Examination of sanctions for corporate and individual offenders. (Examination)

366 Law and Criminology (2) Shilton

The role that criminological knowledge of crime causation may play in assisting lawyers to appraise the effectiveness of various alternative social and legal devices in controlling deviant behavior. The search for factors related to criminal behavior will be developed historically, with emphasis on current causal theories developed by various disciplines. Model as well as operational penal codes, sentencing and probation practices, and specialized facilities will be analyzed in terms of their relationship to such causal theories. (Take-home examination)

369 Computer Crime (2 or 3) Kerr

The legal issues that judges, legislators, and prosecutors confront in response to computer-related crime. How computer crimes challenge traditional approaches to the prohibition, investigation, and prosecution of criminal activity. Topics include computer hacking, computer viruses, Internet gambling, encryption, online undercover operations, the Fourth Amendment in cyberspace, the law of Internet surveillance, laws governing access to e-mail, and federal–state relations and international cooperation in the enforcement of computer crime laws. (Examination)

370 Forensic Science (2) Starrs, Melson, Snyder

Designed to acquaint the student with the operations of a modern crime laboratory and the courtroom acceptability of testimony of forensic scientists and other evidence on laboratory test results. Identification of individuals (fingerprints, palmprints, footprints, voiceprints, anthropological reconstruction, hair identification, and serology), identification of objects (ballistics, handwriting, typewriting, fiber identification, paints, varnishes, glass, wood, and paper), toxicology, pathology, forensic use of the microscope and the camera, the coroner and the medical examiner systems, and drug law enforcement. Crime laboratory guest lecturers. (Examination)

372 Drugs and the Law (2) Sirulnik, Meyers

A study of federal and state laws controlling illicit drugs, including the historical evolution of these laws, current offenses and penalties, constitutional limits

on the criminal sanction, enforcement practices, and sentencing considerations. Alternative models for controlling drugs, including decriminalization and legalization will also be studied. Six class sessions will be devoted to mock criminal trials at which student teams conduct direct and cross-examination of guest expert witnesses in the field. Other students may be assigned to internships with the U.S. Attorney's Office, Public Defender Service, or other institutions involved in drug law or policy. All participants will be graded on the basis of assigned memoranda pertaining to the legal issues involved in the mock hearings or internships, or special research papers assigned by the instructors. Prerequisite: Law 230. (Litigation exercise or writing assignment)

376 Prisoners Project (1, 2, or 3) Turley

Open to second- and third-year students. A clinical project concerned with the legal status of older prisoners (over 55 years of age). The project works for the release of high-cost, low-risk prisoners into stable environments. Students work on either individual cases or research. Case workers interview prisoners to evaluate and prepare cases for pardon, parole, or possible *habeas* appeals. Research projects will cover subjects ranging from overcrowding to health acre to risk assessment. Some legislative work is also possible. Students may enroll concurrently in this course and Law 633 only with permission of both instructors. This course is graded on a *CR/NC* basis.

379 Criminal Law and Procedure Seminar (2) Cheh, Kirschner

Selected topics in criminal law and procedure to be announced at the time of registration. Enrollment is limited. (Research paper)

Constitutional Law and Civil Rights

380 Constitutional Law II (3 or 4) Barron, Cheh, Colby, Dienes, Lupu, Rosen

Individual rights and liberties in the U.S. constitutional scheme and the different judicial methods of reconciling majoritarian governance with individual freedom. Privileges and immunities of national citizenship, due process of law, equal protection guarantees, freedom of expression and of religion, rights of privacy and association. Credit may not be earned for both Law 380 and 381. (Examination)

382 The First Amendment (3) Barron

The rights of expression, association, and religious freedom recognized by the First Amendment to the U.S. Constitution. Categories of unprotected expression (e.g., obscenity) and less-protected expression (e.g., commercial speech). Issues of time/place/manner regulation, speech in public fora, regulation of political campaigns. Constitutional burdens and benefits unique to religion. Material includes Supreme Court decisions and secondary literature on these subjects. (Examination)

383 Counterterrorism Law (2) Letter

Analysis of legal mechanisms in the fields of criminal, civil, military, immigration, and administrative law used by the U.S. government to combat domestic and international terrorism. The effectiveness of government actions and alternatives for achieving public safety goals; the effect of such actions on U.S. citizens and citizens of other countries; and the reaction of federal courts and Congress to executive branch actions. Credit may not be earned for both Law 383 and 386. (Examination)

384 Law of Separation of Powers (3) Peterson

An examination of the law that governs the interrelations of the three branches of the federal government. Topics include the constitutional history of our governmental structure, the immunities of members of Congress and of executive officers, impeachment, congressional power over federal jurisdiction, executive orders and the limits of presidential "lawmaking," presidential and legislative vetoes, executive privilege, executive and congressional oversight of policy through supervision of the bureaucracy, controls on spending including impoundment, limits on presidential discretion to enforce the laws (e.g., special prosecutors), Congress's and the president's roles in foreign affairs (executive agreements, claims settlements, treaty powers), and congressional and presidential war powers. Emphasis will be placed on the role of the lawyer as gov-

ernment adviser, a role performed by many attorneys at all levels of government. (Examination)

385 U.S. Foreign Relations Law (2) Murphy, Anderson
The nature and origins of the federal government's foreign relations powers; cooperation and competition between the executive and legislative branches; the role of the courts in foreign affairs; limitations on state powers touching on foreign affairs; treaties, executive agreements, and customary international law and their relationship to U.S. domestic law; the extraterritorial application of U.S. law; and sovereign and official immunities. Credit may not be earned for both Law 385 and 562. (Examination)

386 National Security Law (2 or 3) Raven-Hansen
U.S. law (and incorporated international law) affecting national security, including the use of armed force abroad (general war, defensive war and reprisal, peace and stabilization operations); intelligence operations abroad (history, organization and oversight, legal issues in the field); counterterrorism (criminalization of sedition, terrorism, and material support, screening and profiling, investigation and surveillance, apprehension, detention, interrogation, prosecution, uses of the military, consequence management, bioterrorism, continuity of government); and access to and protection of classified information (classification, FOIA, state secrets privilege, leak control, prior restraints on publication). Credit may not be earned for both Law 383 and 386. (Examination)

387 Voting Rights Law (2) Overton, Pershing
Cases and materials on the right to vote in the United States. Major decisions on apportionment, political participation, and race as an issue in representation. Emphasis on the Voting Rights Act of 1965, including minority vote dilution litigation under Section 2, federal review of voting procedures under Section 5, and recent constitutional challenges to voting rights remedies. Other topics include partisan gerrymandering, the initiative and referendum processes, alternative election systems, the changing law of redistricting, the impact of shifts in census policy, and the litigation over the 2000 presidential election. (Examination)

388 Civil Rights Legislation (3) Overton
Examination of federal legislation protecting individual rights and liberties as well as the administrative and judicial implementation of that legislation. Remedial provisions for the enforcement of federal constitutional and statutory rights (e.g., 42 U.S.C. §§1983, 1985) and federal statutes prohibiting discrimination in housing, contractual relations, voting, education, and federally funded programs. Prerequisite: Law 380 or 381. (Examination or take-home examination)

389 Higher Education Law (2)
Examination of legal issues concerning institutions of higher education, including intellectual property, labor relations, privacy, affirmative action, and land use. Governance structures of public and private institutions, and the relationship between the institution and faculty, staff, students, the community, and state and federal government. (Examination)

390 Employment Discrimination Law (2 or 3) Selmi, Morris
Federal laws and executive orders relating to various types of discrimination in employment, including Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1991, the Equal Pay Act, the Age Discrimination in Employment Act, the Rehabilitation Act, the Americans with Disabilities Act, the Civil Rights Act of 1866, the Fourteenth Amendment, the National Labor Relations Act, and Executive Orders 11,246 and 11,375 relating to government contractors; substantive rights, exemptions, and burdens of proof under the various laws and regulations. (Examination)

392 Gender Discrimination and the Law (2) Ridder
An examination of the treatment of women in all areas of the law and legal remedies for sex discrimination. Emphasis on constitutional law, family law, and discrimination in employment. Enrollment limited to 30 students. (Examination or research paper)

394 Sexuality and the Law (2 or 3) Schaffner
Examination of the relationship between sexuality and the law, focusing primarily on the treatment of lesbians, gay men, and bisexuals in the areas of family law, employment law, constitutional law, and criminal law. Topics include how the

legal system regulates and affects bisexual, lesbian, and gay sexual behavior; open expressions of lesbian, gay, and bisexual identity; workplace effects; lesbian, gay, and bisexual relationships; and lesbian and gay parenting. (Examination)

395 Constitutional Law and the Supreme Court (2) Turley, Garre, Salmons

Analysis of selected cases currently pending before the Supreme Court. Students read briefs and related materials (such as lower court decisions and controlling cases) in cases scheduled for oral argument, discuss the cases in class, vote on how they would decide the cases, and then draft opinions for class circulation and review. Each student will be required to draft two lengthy majority opinions, a concurrence, and a dissent. The course will also focus on how the Supreme Court works both as an institutional and practical matter. (Writing assignments)

397 Federal Indian Law (2) Alexander

Basic legal principles that govern the relationship between American Indian tribes, the federal government, and the state governments. Focus on jurisdictional disputes between those governments, the source and scope of Indian sovereignty, and recognition and enforcement of Indian land and treaty rights. (Examination or research paper with permission of the instructor)

398 Law of Privacy (2)

A review of the law of privacy as it has developed in constitutional litigation, tort law, and state and federal statutes. Current developments and rationales for further expansions of privacy rights are considered. (Research paper)

399 Constitutional Law Seminar (2) Clark, Lupu, Rosen, Ross, Peck

Selected topics in constitutional law to be announced at the time of registration. Enrollment is limited. (Research paper)

Administrative Law and Government Regulation

400 Administrative Law (3) Duffy, Molot, Park, Pierce, P. Smith

Study of the administrative processes of government in executive and independent agencies. The federal Administrative Procedure Act is emphasized, with particular attention to adjudication, rulemaking, judicial review, investigatory powers, and enforcement. Study may include comparative state administrative law. Constitutional topics include separation of powers and due process. (Examination)

402 Antitrust Law (3) Kovacic, Morgan, Pierce

Federal antitrust law and policy under the Sherman, Clayton, and FTC Acts; basic economic theory of free-market operation; the Rule of Reason and *per se* offenses; price fixing, market division, and boycotts; trade association activities; monopolization and attempts to monopolize; mergers and joint ventures; resale price maintenance and other vertical restraints; exclusive dealing and tie-in agreements; selected exemptions from antitrust liability. (Examination)

403 Advanced Antitrust Law Seminar (2) Schwarz

Issues faced by regulators and courts in the process of reconciling antitrust law with a variety of other public policies, including intellectual property rights, collective bargaining rights, rights to petition and seek redress via government action, and international relations and trade policy. Prerequisite: Law 402. (Research paper)

404 Regulatory Theory and Practice (2) Swire

Assessment of the advantages and disadvantages of various institutional approaches to regulatory theory, including markets, regulatory agencies, the tort system, specialized statutes, and criminal law. Application of theory to the legal and policy question of how to improve the security of networked computer systems in the face of changing threats and evolving technology. No previous computer expertise required. (Examination)

406 Regulated Industries (2 or 3) Pierce

Substantive problems of business regulation in terms of natural monopolies, licensed industries, health, safety, and rate regulation. Typical problems raised include the impact of regulation upon management and market behavior, the uses of economic evidence, and the effects of judicial and legislative review. (Examination)

408 Food and Drug Law (2) Adams, Safir
Consideration of the standards of federal law applicable to the compositional and representational elements of foods, drugs, medical devices, and cosmetics. Provisions of the Federal Food, Drug, and Cosmetic Act, their development, application, and judicial and administrative interpretation. (Examination)

410 Health Care Law (4) Rosenbaum
Survey of the history, structure, and operation of the health care delivery system and related legal and policy issues. Emphasis on public and private health care financing, antitrust, fraud and abuse, managed care, tort liability of medical professionals and institutions, tort reform, and definition and regulation of the quality of health care. Concepts and terms of health care delivery, particularly the design, finance, and administration of current and proposed arrangements. (Take-home examination)

411 Health Care Law Seminar (2) P. Cooney
Intensive study of the health care industry, focusing on one or more of the following topics: liability arising out of managed care, ERISA preemption of state health laws, and a study of various federal antitrust statutes as they pertain to health care. (Research paper)

412 Communications Law (2 or 3) Dienes
Study of the text, historical origin, and theoretical foundation of the Press Clause and of the role played by the mass media in modern society. Examination of the common law and constitutional protection accorded mass media publishing in areas such as libel law, the law of privacy, and liability for physical, emotional, or economic harm. The legal status of newsgathering, including journalist's privilege and access to information possessed by government. Problems of reconciling freedom of the press with guarantee of a fair trial. Government regulation of commercial speech, including advertising and promotion. Prior or concurrent enrollment in Law 380 is recommended. (Examination)

413 Broadcast and Cable Regulation (2 or 3) Barron
Study of the origins and development of electronic media and an examination of the continuing debate over regulation and deregulation of broadcasting. The allocation of the broadcasting spectrum, licensing and licensing renewals, and regulation of programming content. Problems posed by concentration of media ownership and the efforts to promote minority participation in ownership and management of broadcasting. The relation of government to public (noncommercial) broadcasting. The development of cable television and problems in regulation and deregulation, including issues of jurisdiction, franchising, syndication or programming, regulation of content control, and mandatory public access. The emergence of new communications technologies and the legal problems they pose. (Examination)

414 Telecommunications Law (2) Brands
Regulation of telephone and related industries. Topics include competition in local-exchange and long-distance service before and after the 1996 Telecommunications Act, federal and state regulatory jurisdiction, universal service issues, and regulation of video, wireless, and Internet services offered by telephone and other telecommunications carriers. (Examination)

416 Legislation (2 or 3) J. Schwartz
Legislative process and the construction and legal effect of statutes. Topics that may be considered include representational structures, lobbying, judicial review, direct democracy, legislative fact-finding and drafting, and the preparation and significance of legislative history. This course is a prerequisite to several advanced public law courses. (Examination)

418 Legislative Analysis and Drafting (2)
Instruction in the basic skills necessary for translating the specifications of the policymaker into legislation. Topics include determining policy objectives and an appropriate legislative scheme for their achievement; an overview of the legislative process; typical provisions in legislation; organizational issues in drafting; and the structural component of legislation. Enrollment is limited. (Drafting assignments)

419 Campaign Finance Law (2) Noble
The history, structure, application, and constitutionality of campaign finance laws. Topics include disclosure, regulation of corporations and unions, contribution

limits, the role of issue advocacy in election campaigns, political party activities, public funding of campaigns, the role of the FEC, criminal enforcement of finance laws, and campaign finance reform. Focus on the Federal Election Campaign Act of 1971 and the Bipartisan Campaign Reform Act of 2002. (Overton—research paper; Noble—examination)

420 Congressional Investigations Seminar (2) Leon
Congressional powers to conduct oversight and investigations of the executive branch. Topics include the scope of Congressional inquiries and investigations; subpoena, grant-of-immunity, hearing, and rule-making powers; the use of select committees, the Government Accounting Office, and other special investigative techniques; pre-hearing depositions; the rights and preparations of witnesses; the role of the press; and the interaction between Congress and prosecutorial functions, including investigations conducted pursuant to the Independent Counsel Statute. (Writing assignments)

421 Lawyers, Lobbying, and the Law (2) Farah, Heimberg
The role of the lawyer in business–government relations. Topics include an overview of government policymaking processes; how lawyers participate in influencing government decisions; the various types of lobbying (grassroots, direct, etc.); ethics and lobbying; lobbying regulatory agencies; and attorney–media relations. (Examination)

422 Local Government Law (2) Thompson
Survey of the legal authority of city, county, and special-district local government units. Topics include the dynamic relationship of municipal governments with state and federal agencies; recent U.S. Supreme Court decisions affecting local governments; organizational structure and internal decision-making processes in metropolitan and other municipal-level governments, and the procedures for changing the form and function of local governments (e.g., annexation); local legislative and administrative authority and processes (e.g., municipal police powers); municipal finance; responsibility in tort and insurance issues; introduction to community and regional land use planning; and joint power agreements and intergovernmental compacts. (Research paper)

424 Animal Law and Wildlife Protection Seminar (2) Lovvorn, Perry
Survey of the treatment of animals in state, federal, and international law. Topics include the historical status of animals; federal statutes such as the Animal Welfare Act, the Endangered Species Act, and the Marine Mammal Protection Act; international conventions, free trade, and comparative animal protection laws; state laws concerning animal cruelty, hunting, animal fighting, and performing animals; free speech, religion, and other constitutional issues; litigation in state and federal courts; citizen initiatives and referenda; and the movement to obtain legal recognition of the rights of animals. (Research paper)

426 Public Law Seminar (2 or 3)
Selected topics in public law to be announced at the time of registration. Enrollment is limited. (Research paper)

Environmental Law

430 Environmental Law (2 or 3) Grodsky
Introduction to the basic theories and statutes of environmental law as a means of understanding why and how environmental activity is regulated. Emphasis on the reasons for regulation and the theories behind environmental protection, which range from the economic school to the "eco-centric" school. Discussion begins with common law remedies for environmental injuries such as nuisance and torts remedies and leads to the regulatory alternative, with a single primary command and control statute—the Clean Air Act—used to emphasize the practical and legal issues surrounding the regulation of the environment. Other statutes, including the National Environmental Protection Act (NEPA), the Clean Water Act (CWA), and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), are covered to a lesser extent. Not for credit toward an LL.M. in environmental law. (Examination)

432 Air Pollution Control (2 or 3) Reitze
An in-depth analysis of the Clean Air Act. Topics include the history of air pollution control, air quality planning, standard setting, technology-based controls,

incineration, indoor air pollution, permitting, and control of electrical utilities. (Examination)

433 Environmental Law Enforcement (2 or 3) Reitze
Enforcement procedures found in federal environmental laws, including record-keeping, monitoring, inspections, administrative compliance orders and penalties, civil penalties, and criminal penalties. Emergency responses, citizen suits, attorney fees, and equitable remedies are covered. Prerequisite: Law 430, 432, or 434. (Examination)

434 Water Pollution Control (2) Downing
Introduction to water pollution control and the Clean Water Act, with emphasis on water quality requirements and policies affecting industrial, municipal, and agricultural/development interests. Related federal laws and policies involving wetlands, watersheds, coastal pollution, oil spills, groundwater, and safe drinking water. (Examination)

435 Trade and Sustainable Development (2) DiLeva, Petsonk
Overview of the major environmental treaties and other legal and institutional frameworks at the intersection of international trade issues and sustainable development efforts. Examination of the frequently conflicting views of judicial and quasi-judicial bodies, policymakers, and issue advocates. Emphasis on developing the theoretical bases and practical skills to address issues of trade and sustainable development that arise in governmental, private sector, and NGO practice, and effective legal strategies for addressing those issues on behalf of a wide range of clients. (Research paper)

436 Water Resources Law (2)
Federal and state powers over water; riparian and prior appropriation doctrines. Rights to surface use of water bodies; groundwater management; interstate allocation of water resources. Recommended as an introductory course. (Examination)

437 Coastal, Navigation, and Wetlands Resource Law (2) Wood
Federal statutory and constitutional law governing the development, regulation, and protection of the waters of the United States, including wetlands. Focus on federal and state regulation and protection of wetlands and other aquatic resources, with special emphasis on Clean Water Act Section 404. Other topics include the evolution of federal authority over the navigable waters of the United States; legal issues involved in the planning, construction, and operation of federal water resource development projects by federal and state agencies (i.e., for navigation, flood control, hydropower, water supply, etc.); the federal navigation servitude; the Coastal Zone Management Act; the Marine Protection, Research, and Sanctuaries Act (i.e., the "Ocean Dumping Act"); the London Dumping Convention; and Fifth Amendment "regulatory takings." (Examination)

438 Energy Law and Regulation (2) Nordhaus, D. Smith
The law and regulation of energy production, transportation, and use. Regulation of utilities at the state and federal level, fuel economy and energy efficiency standards, public land law as it applies to energy extraction, nuclear and hydroelectric licensing, and tax and finance issues. (Research paper)

439 Environmental Issues in Energy Law (2) Jacobson, Nordhaus
Energy law and policy based on environmental impacts of energy production. Overview of energy law and regulation, including laws relating to nuclear energy, renewable and nonrenewable energy, and energy efficiency. Energy security, facilities siting, climate change predictions, and regulation of electric power production in terms of environmental impacts. (Simulation and research paper)

440 Natural Resources Law (2) Dreher
Introduction to federal public lands (BLM lands, national forests, national parks, and national wildlife refuges) and the legal issues related to their multiple resource uses—forestry, mining, water, recreation, wildlife, endangered species, and wilderness. Principles of federal and state authority over these lands. Administrative law and practice governing land-management agency decision making and litigation challenging such decisions. Focus on topical case studies, statutory materials, and case law. (Examination)

441 Regulation and Management of Ecosystems (2)
Study of the recreational and preservationist uses of lands from the perspective of ecosystem management as an appropriate legal and managerial tool. The Surface Mining Control and Reclamation Act and the Endangered Species Act along with other laws regulating wildlife management will be examined. (Examination)

442 Control of Solid and Hazardous Wastes (RCRA & CERCLA) (2 or 3) Boxerman, Mounteer
Analysis of the federal and state laws and regulatory schemes relating to the control of toxic and hazardous substances. The Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund") are examined. (Problem assignments)

449 Toxic Tort Litigation (2) Hicks
The use of common law remedies to compensate those injured by diseases caused by toxins and characterized by long latency periods and, usually, relatively low levels of exposure. Insurance, workers compensation, and evidentiary issues. (Examination)

450 Federal Facilities Environmental Law Issues (2)
Analysis of the legal framework governing environmental law compliance at federal facilities. Review of a wide range of environmental, fiscal, and other laws that uniquely regulate federal installations and operations. Topics include the National Environmental Policy Act, statutes governing management and conservation of federal property, expenditure of federal funds, public involvement in federal environmental decision making, federal–state sovereignty issues, federal agency litigation, and professional responsibility issues. Prerequisite or concurrent enrollment: Law 432, 434, and 442. (Problem assignments)

452 Environmental Issues in Business Transactions (2 or 3) Mounteer
Focus on applied environmental law. Emphasis on environmental compliance counseling, identifying environmental issues in business and real estate transactions, and drafting techniques to avoid environmental problems. Topics include environmental audits, securities disclosure issues, green advertising, criminal liability for officers, environmental liability for purchase of stock and corporate assets, lender liability, and partnership liability. Prerequisite: any environmental law course. (Take-home examination)

454 International Environmental Law (2 or 3) Shelton
The treaty negotiation process, role of international institutions in developing and implementing environmental agreements, relationship between environmental law and international issues, developing countries' perspectives on environmental issues, and social and cultural changes that affect the implementation of environmental law. Issues covered include climate change, export of hazardous waste, deforestation and biodiversity, Antarctica, and environmental concerns in war, human rights, and development financing. (Examination)

456 Environmental Planning (2) Van Ness
Impact of environmental laws on government decision making, including administrative law issues, comprehensive transportation planning, the National Environmental Policy Act, historic preservation, parkland protection, the Coastal Zone Management Act, wetlands protection, farmland protection, the Endangered Species Act and other wildlife issues, mitigation of environmental impacts, role of governmental policies relating to the environment, legislative issues, and state environmental laws. (Examination)

457 Sustainable Regional Growth Seminar (2) Schilling, Weiss
Focus on the emerging field of "smart growth"—regional development that takes into account economic, environmental, and social considerations. Factors influencing sprawl; urban trends in the U.S. and abroad; and new legal and interdisciplinary approaches to promote comprehensive planning, urban redevelopment, and regional competitiveness. (Research Paper)

458 Environmental Negotiations (2) Juni, Rogers
Negotiation and alternative dispute resolution theories and processes, focusing on complex environmental disputes and transactions involving multiple parties and scientific or technical issues. Students participate in negotiation and mediation exercises both in and outside of class, using diagnostic and other tools useful for pre-negotiation preparation, mid-negotiation analysis, and post-

negotiation evaluation of proposed agreements or deadlock. Prerequisite: completion of at least 6 credits of environmental law courses or permission of the instructor. Credit may not be earned for both Law 458 and 648. (Simulation and short papers)

464 Environmental Crimes (2) Mushal
Focus on crimes under various federal environmental statutes, including the interplay of statutory and regulatory provisions that define such crimes, development of investigations and prosecutions, the rationale for criminal sanctions for certain environmental violations, and salient policies and issues associated with environmental crimes. Prior experience with environmental law from either an academic or a practical perspective is recommended. (Examination)

465 Environmental Crimes Project (1 or 2) Turley
Focus on litigation and legislative projects relating to environmental crime. Students work on federal or state legislation to enhance both the existing environmental criminal laws and the resources available for their enforcement. Students also work with the instructor on developing environmental criminal cases around the country. Prerequisite: Law 430 and 464. The instructor's approval is required for enrollment. Students may enroll concurrently in this course and Law 668 only with permission of both instructors. This course is graded on a *CR/NC* basis. (Writing and project assignments)

466 Environmental Law Seminar (2)
Selected topics in environmental law to be announced at the time of registration. May be repeated for credit provided the topic differs. Enrollment is limited. For LL.M. students; J.D. students may enroll only with permission of the environmental law program director. (Research paper)

467 Environmental Legislation Project (1, 2, 3, or 4) Turley
Open to second-, third-, and fourth-year students with permission of the instructor. Legislative research and drafting projects related to environmental issues. Students work under supervision of the instructor in conjunction with federal and state legislators and committees to draft specific bills or background papers for congressional committees or state bodies. Enrollment is limited. The grade of *H*, *P*, *LP*, or *NC* is given for this course. Prerequisite or concurrent registration: Law 430. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

468 Graduate Environmental Placement (1, 2, 3, or 4) Reitze
The student works on a project in the environmental law field under the supervision of both the faculty director of the program and a lawyer practicing environmental law. The project may involve working with a government agency, a congressional committee, a private practitioner, or a nonprofit public-interest environmental organization. Admission to the course is limited to LL.M. students with permission of the environmental law program director. Students may earn no more than a total of 4 credit hours for this course. This course is graded on a *CR/NC* basis. Five hours of work per week are required for each credit.

Intellectual Property Law

470 Intellectual Property (3) Siegel
Survey of the different legal mechanisms for protecting intellectual property, including patent, trademark, copyright, and related state–law doctrines. This course is intended for students who desire a general exposure to intellectual property law but who do not plan to specialize in the field; taking this course as a foundation for more specific intellectual property courses is not recommended. Not for credit toward an LL.M. in intellectual property law. (Examination)

471 Patent Law (2 or 3) Duffy, Rader
An overview of patent law designed for students without a patent background, including those without a technical background. Analysis of the goals and costs of the patent law system. Topics include patentability requirements, infringement, remedies, patent prosecution issues, and patent transactions. (Examination)

472 Copyright Law (2 or 3) Brauneis, Oman
Historical background and general survey; how copyright is secured and maintained; subject matter of copyright; scope of protection; duration, renewal, and

termination of transfers; jurisdiction and remedies; contracts and combinations, including compulsory licenses and performing rights societies; other doctrines neighboring on copyright; international aspects of copyright, including the Berne convention and other treaties on copyright and related subjects. (Examination)

473 International Copyright Law (2) Schlesinger, Poor
Survey of the international law of copyright, including basic principles of territoriality, national treatment and reciprocity, jurisdiction and choice of law; key bilateral, regional, and multilateral treaties and institutions; the intersection of copyright and trade law; international enforcement; and principal unresolved international issues. Prerequisite: Law 472. (Examination)

474 Trademark Law and Unfair Competition (2 or 3) Brauneis
Consideration of how trademark rights are acquired at common law and under the Lanham Act; permissible and impermissible types of marks and the problem of "genericness"; protection of trade dress; trademark infringement and dilution; permissible uses of other firms' marks; trademark licensing and remedies; the right of publicity; and competitor and consumer remedies for false advertising under the Lanham Act and state statutes. When offered for 3 credits the course also addresses interference with contractual relationships and prospective economic advantage; the misappropriation doctrine; theft of business ideas and trade secrets; and prohibitions against unfair and deceptive practices under the Federal Trade Commission Act. (Examination or take-home examination)

475 Entertainment Law (2) Rosenthal
Overview of legal problems in film, theater, television, music, and publishing industries. Topics include the role of agents and managers, contractual provisions in different entertainment industries, protection for ideas and stories, right of publicity, and advanced copyright issues. Prerequisite: Law 472 or permission of the instructor. (Examination and negotiation and drafting exercises)

476 Patent Strategies and Practice (2) Barufka
Patent practice and issues, with emphasis on strategic considerations. Focus on claim craftsmanship and consequences. Prerequisite: Law 471 or permission of the instructor. (Examination)

477 The Federal Circuit (2) Rader
The unique role of the U.S. Court of Appeals for the Federal Circuit as the only national court of appeals organized on the basis of subject matter rather than geography. Topics include the creation of the Federal Circuit and an overview of its varied jurisdictions (e.g., government contracts, constitutional takings, and international trade). Emphasis on the contributions of the Federal Circuit to patent law, and in particular its administration of eligibility, bars, "nonobviousness," equivalents, and other modern patent law problems. Comparative study of the patent jurisprudence of the Federal Circuit and other nations' courts. (Examination)

478 Licensing of Intellectual Property Rights (2) Bleeker
The legal context of licensing situations; rights and duties of parties to license; appropriate terms and conditions in contracts; antitrust and misuse constraints, including international considerations for Europe and Japan; and selected policy and practice considerations in international licensing. (Examination)

479 Intellectual Assets Management (2) Moore, Craig
Theoretical and practical perspectives on the management of intellectual assets, such as brands, technology, and know-how, within economic, financial, and legal contexts. The role of intellectual assets in corporate strategy, especially those recognized under current intellectual property, business, and taxation laws; the limits of protection, claims for relief, and the extent of damages that may be recovered; identifying, organizing, optimizing, leveraging, and valuing intellectual assets for companies of different sizes and in a variety of industries. Prerequisite: Law 470, 471, 472, or 474, or permission of the instructor. (Examination)

480 Chemical and Biotech Patent Law (2) Adelman, Straus
Public policy and practice considerations relating to patenting biotechnology and chemical inventions with in-depth treatment of unique practice areas. Open to LL.M. students; J.D. students may enroll only with the prior permission of the instructor. (Examination)

482 Patent Enforcement (2) Davis, Ferguson, Lever, Hopenfeld, McKelvie, Rainey

Patent litigation for those who may wish to specialize in general litigation with occasional handling of patent cases, as well as for those interested in a patent solicitation career. Focuses on a rounded understanding of policy and practice considerations in the enforcement of patents. (Examination)

483 Patent Appellate Practice (2) Dunner

Comprehensive study of the Court of Appeals for the Federal Circuit and its jurisdiction over patent cases from the perspective of an appellate practitioner. Litigation strategies and the process of guiding a client through an appeal. (Examination)

484 Computer Law (2) Stern

Intellectual property rights in computer software and in cyberspace. Public policy issues relating to software and computer-related inventions and works; patent vs. copyright vs. *sui generis* protection debate. Patent or copyright background and some knowledge of computer technology is helpful. In even-numbered years focus is on copyright; in odd-numbered years focus is on patents. Open to LL.M. students; J.D. students may enroll only with permission of the instructor. (Research paper)

485 Law in Cyberspace (2) Nunziato

Survey of theoretical and practical aspects of legal issues concerning cyberspace, including First Amendment free speech rights, commerce, computer crime, privacy, political participation, and jurisdiction. Computer background is not a prerequisite. (Examination)

486 Information Privacy Law (3) Solove

Information privacy law, including the development of constitutional, tort, contract, property, and statutory law to address emerging threats to privacy. Privacy and the media, privacy and law enforcement, workplace privacy, privacy and online transactions, medical and genetic privacy, and privacy and personal records and information. (Examination)

488 Art, Cultural Property, and the Law (2) M. Shapiro

Legal and policy implications of the intersection of art and the law, including intellectual property, First Amendment, and international law issues. Legal relationships between artists, dealers, auction houses, collectors, and museums. The international framework for the trade and protection of cultural property. Prior course work in intellectual property law and international law is recommended.

490 International and Comparative Patent Law (2) Adelman

A study of patent reform issues including domestic patent reform legislation and ongoing harmonization treaty discussions under WIPO; review of selected topics with comparative study from viewpoint of Japan, the United States, and Europe. (Research paper)

494 Intellectual Property Antitrust Seminar (2) Adelman

Domestic and international concerns relating to antitrust and fair trade, with emphasis on U.S., European, and Japanese models. Consideration of basic intellectual property principles in patents, trademarks, and copyrights necessary for application of antitrust principles. Advanced understanding of antitrust law is a prerequisite unless waived by the instructor. Enrollment is limited. Prerequisite: Law 402 or permission of the instructor. (Research paper)

496 Intellectual Property Law Seminar (2) Mossinghoff, Oman

Selected topics in intellectual property law to be announced at the time of registration. Open to LL.M. students; J.D. students may enroll only with the prior permission of the instructor. (Research paper)

Government Contract Law

500 Government Contracts (3) J. Schwartz

Survey of the basic principles of government procurement, including the powers and limitations on government instrumentalities entering into contracts, the respective roles of the three branches of government in the process, the processes of contract formation and administration, the resolution of disputes

arising out of both processes, and the various forums available for dispute resolution. Although the focus of this course is primarily on federal government procurement, there will be some consideration of state and local government contracting and may be some coverage of procurement by other nations or international organizations. This course covers some of the material covered in Law 502 and 503, but at an introductory level. Not open to students in the LL.M. program in government procurement law. (Examination and problem assignments)

502 Formation of Government Contracts (4) Yukins, D. Gordon
Survey of the law pertaining to government procurement, including an analysis of the unique features of government contracting and a discussion of the functions of Congress, the executive branch, and the courts in the procurement process. The course focuses on the contract formation process, including techniques for awarding contracts and litigation and protests involving awards. (Examination and problem assignments)

503 Performance of Government Contracts (4) Lees, Schooner, Yukins
Discussion of the substantive problems that most frequently arise during the performance of government contracts. Interpretation of specifications and the most generally used contract clauses; analysis of the rights of the parties when performance in accordance with the terms of the contract is not obtained. Analysis of the methods that can be used by the parties to a government contract to obtain legal relief, including detailed coverage of the disputes procedure, actions for breach of contract, and forms of equitable and extraordinary relief. (Examination and problem assignments)

506 Government Contracts Cost and Pricing (2) Knight
Legal aspects of government contract accounting principles and allowability of costs. Cost accounting standards and cost allocation issues. Negotiation of cost, profit, and price. Disclosure of cost accounting data. (Problem assignments)

507 Government Contracts and Environmental Law Seminar (2)
Focus on the wide range of environmental issues presented in the government contract formation and performance process, as well as the manner in which federal procurement law may be used to advance the goals of the environmental community and to implement environmental programs. Consideration of the nature and purpose of applicable environmental procurement statutes and regulations; selection of qualified environmental contractors; buying "green" products and services and contract types; sharing of responsibility for clean-up and remedial efforts and inherent problems at government and contractor facilities; applicable cost and pricing principles; and current developments and initiatives in the environmental law field. (Research paper)

508 Comparative Public Procurement (2) Yukins, D. Gordon
Comparative study of laws, regulations, and procedures dealing with public procurement. Differences between national and international procurement practices, and common principles that span many procurement systems across the world. Contract formation, performance, and dispute resolution processes. The influence of international organizations such as the European Union (EU), United Nations Commission on International Trade Law (UNCITRAL), World Trade Organization (WTO), financing institutions, and professional organizations. Prerequisite or concurrent registration: Law 500, 502, 503, or permission of instructor. (Research paper)

509 Government Contracts Seminar (2) Lees, Yukins, Briggerman
Selected topics in government procurement law to be announced at the time of registration. (Research paper)

510 Graduate Government Contracts Placement (2, 3, or 4) Lees, Schwartz
Students work on a project in the government contracts field under the supervision of the faculty directors of the program and a lawyer practicing government contract law. The project may involve working with a government agency, a congressional committee, a private practitioner, or a nonprofit public-interest organization. Admission to the course is limited to LL.M. students and requires

approval of one of the faculty directors of the program. This course is graded on a *CR/NC* basis. Five hours of work per week are required for each credit.

International Law

520 International Law (3 or 4) Murphy, Steinhardt, Swaine
Introductory survey of the legal system governing relations among states and its expansion to non-state actors, such as international organizations, natural and juridical individuals, indigenous groups, and proto-states. Analysis of the sources of international law, including the formation of customary norms and techniques of treaty interpretation; the application and enforcement of international law in domestic courts, international tribunals, organizations, and diplomacy; doctrines of jurisdiction and immunities; the impact of emerging states and new technologies on doctrine; the use of force; human rights; constitutional aspects of international law; and recurring political and jurisprudential issues. (Examination)

522 International Business Transactions (3) Charnovitz, Karamanian, Spanogle
U.S. law and practice relating to characteristic forms of international transactions, including the transnational sale of goods (the law governing the documentary sale, various forms of letters of credit, commercial terms and insurance); the export of technology through franchising, distributorship, and licensing contracts; and the export of capital through the establishment, operation, and withdrawal of foreign direct investment. The impact of relevant international organizations and/or emerging substantive international commercial law (e.g., the United Nations Convention on Contracts for the International Sale of Goods). Specialized problems in the negotiation and structure of international transactions. (Examination)

524 International Commercial Law (2) Spanogle
The study of international transactions for the purchase, sale, payment for, and financing of goods, as governed by the U.N. Convention on Contracts for the International Sale of Goods and other multilateral treaties on international lease financing, factoring, commercial paper, and fund transfers. The substantive provisions of these treaties, the process by which they are developed, and the various interpretive approaches available under different legal regimes will be considered. (Examination or research paper with permission of the instructor)

525 International E-Commerce Seminar (2)
How different legal regimes attempt to facilitate and regulate electronic commerce, and how the application of different national rules to transactions creates problems for e-merchants. Topics include formation, terms, and party protection on electronic contracts; the jurisdiction of private parties to sue and of public authorities to regulate e-merchants; privacy; and intellectual property and taxation issues. Enrollment is limited. Credit may not be earned for both Law 283 and 525. Prerequisite: Law 234 or 522. (Research paper)

526 International Trade Law (2 or 3) Charnovitz
Study of domestic and international laws and institutions governing foreign trade. Legal aspects of U.S. participation in the World Trade Organization, NAFTA, and other international forums; laws regulating customs and tariffs, most-favored nation treatment, subsidies, dumping, unfair trade practices, and disruptive imports under the escape clause. Specialized problems in regulating exports under the Export Administration Act, boycotts, corrupt practices, and restrictive business practices may be covered. (Examination)

527 Advanced International Trade Law (2 or 3) Charnovitz
In-depth study of such topics as the operation and use of controversial trade remedies such as unilateral retaliation; intellectual property protection under GATT–WTO and NAFTA; the treatment of developing countries in the world trading system and programs such as the Generalized Systems of Preferences; the relationship between trade and labor; the relationship between trade and environmental protection; and trade liberalization in special sectors such as financial services, agriculture, and government procurement. Specialized problems involving emerging linkages between international trade and other fields, particularly philosophy and jurisprudence, international relations, development

economics, human rights, and national security. Prerequisite: Law 526 or permission of the instructor. (Examination)

528 International Litigation (2 or 3) Steinhardt
Analysis of the law relevant to the trial of cases having international elements in U.S. domestic courts, including the problems of establishing jurisdiction over foreign defendants, obtaining transnational discovery and service of process, enforcing foreign judgments, drafting and defending choice of forum and choice of law clauses, determining the extraterritorial reach of U.S. law, proving foreign law, and assessing the role of U.S. courts in deciding cases with potential consequences for U.S. foreign relations. The impact of international issues on actual litigation as well as the initial structuring of a transaction in light of the client's potential litigation interests. Prerequisite or concurrent registration: Law 520; for post-J.D. students, permission of instructor may be substituted. (Examination)

529 International Labor Standards and the Global Economy (2) Samet
Development of international labor standards and operation of the International Labor Organization. World Trade Organization action on labor standards and U.S. laws linking labor conditions with trade, including the Generalized System of Preferences, African and Caribbean trade preference programs, and NAFTA. Voluntary and private-sector initiatives. (Research paper or examination)

530 International Organizations (2 or 3) Murphy
Analysis of characteristic legal issues arising out of the creation and operation of organizations of nation states. Included are issues of legal personality, treaty making and norm creation, law making, privileges and immunities, membership, dispute settlement, and withdrawal. Emphasis on the United Nations and its activities, including those relating to peace, security, and human rights. Exemplary problems in organizations such as the International Labour Organization, the World Health Organization, and the World Trade Organization. (Examination or research paper with permission of instructor)

531 International Judicial Assistance (2 or 3) Ristau
Overview of the assistance rendered by U.S. courts to foreign and international tribunals in securing evidence and serving foreign judicial documents in this country; how litigants before U.S. courts may obtain such aid abroad. Review of conventions and treaties on mutual judicial assistance in force in the United States. (Examination)

532 Comparative Law (2 or 3) Cummins
Study of legal systems in the civil law tradition (France, Germany, Italy, Spain, Latin America, Japan). Comparison with the common law system. Consideration of the history and sources of the civil law, the major public and private law institutions in civil law countries, civil and criminal procedure, the role of civil law lawyers (and of international lawyers working with them), and selected substantive legal issues. Several sessions are devoted to Islamic law as an example of a sophisticated non-European system. (Examination)

533 Transnational Family Law (2 or 3)
Comparative study of domestic and international laws and institutions affecting family law. The role of the state and religion in family decision making, marriage, divorce, child custody, property distribution, alimony, adoption, and inheritance rights. Treaties affecting substantive rights and international recognition of domestic decisions. Prerequisite or concurrent enrollment: Law 348; permission of the instructor may be substituted. Recommended: Law 520 or 532. (Examination or research paper with permission of the instructor)

534 Law of the European Union (2) Swaine
Study of the legal nature and structure of the European Union. Topics include the roles of the Court and the other institutions, the question of sovereignty, the "four freedoms," competition, company law and labor relations, agriculture, and the EU in international law. (Examination)

535 Islamic Law (2) Al-Meswari
Overview of the origins of Islamic law and development of schools of Islamic jurisprudence. Foundations of Islamic constitutional law, separations of powers, civil rights, the law of obligations, formation and dissolution of contracts, remedies, business contracts, banking law, and family law including marriage, divorce,

child custody, and the law of property and inheritance. Crimes and punishments. Islamic law as it pertains to international issues. (Examination or research paper with permission of instructor)

536 Law of Japan (2) Goodman
An introduction to the constitutional structure of Japan, including political institutions and the judicial system, the legal profession, corporate law, business organizations, commercial law, administrative regulation, taxation, dispute resolution, intellectual property, the Antimonopoly Act, and negotiating and drafting agreements. (Examination or research paper with permission of the instructor)

537 Traditional Jewish Civil Law (2) Lewin
Introduction to the methods, history, structure, and substance of traditional Jewish civil law. Using a section of the codified Jewish oral law known as Bava Basra, this course explores traditional Jewish civil law doctrine concerning topics such as property relationships between neighbors, mutual mistake and deception in sales contracts, inheritance, and topics relating to the law of evidence. In selected areas, the traditional Jewish civil law will be compared to the law of U.S. jurisdictions addressing similar issues. All materials for the course are in English and no familiarity with Hebrew or prior knowledge of Jewish law is required. (Research paper)

538 Immigration Law I (2 or 3) Benítez, Morales
Theory and application of the Immigration and Nationality Act and 8 Code of Federal Regulations. Examination of practice before the Executive Office for Immigration Review, Citizenship and Immigration Services, Immigration and Customs Enforcement, Customs and Border Protection, Department of State, and Department of Labor. Removal, political asylum, adjustment of status, naturalization, and other issues. Enrollment is limited. (Examination)

539 Immigration Law II (2) Lawrence
Focus on family- and employment-based immigration practice. Examination of the procedural aspects of obtaining lawful permanent resident status in the United States through the family and/or employment preferences categories, as well as the process for obtaining non-immigrant admission. (Take-home examination)

540 Refugee and Asylum Law (2) Corcoran
Selected topics from the areas of international law pertaining to the protection of refugees and domestic law of political asylum. Enrollment is limited. (Take-home examination)

541 Introduction to Chinese and Japanese Law (3)
Introduction to the traditional and modern legal systems of China and Japan. The relationship between law and society and the influence each culture has had upon the other are considered through comparative study of the development of legal institutions and fields of law. Topics include constitutional structures, judicial systems, legal professions, administrative regulation, contracts, property, personal injury, corporate law, and dispute resolution. (Examination or research paper with permission of the instructors.)

542 International Banking (2) P. Robinson
Study of the legal aspects of international banking and finance, including international laws and regulations concerning the structure and transactions of international banks and institutions. Topics include the institutional, legal, and regulatory framework for international commercial banking and development finance; the emerging rules regarding international trade in financial services; international supervision of banking activities and regulation of banking transactions; contractual instruments for international financial transactions; and international debt and development crisis. (Examination)

543 Law of the People's Republic of China (3) Clarke
Introduction to the basic institutions and processes of the legal system of the People's Republic of China. Focus on the contemporary system and its role in political, economic, and social developments. (Take-home examination)

544 Foreign Direct Investment (2) Alexandrov
An examination of the legal, business, and financial problems involved in investing across national borders. Focuses on the strategies and techniques for struc-

turing such investments and on the framework of regulation that affects them. The analysis includes U.S. regulation of foreign investors, different types of foreign regulation of U.S. investments, and international controls on domestic regulation of foreign investment through treaties and conventions. Model international transactions and sample documents are used to illustrate basic issues. (Examination)

545 International Project Finance (2) G. Smith
The use of contracts to shift and mitigate risks inherent in the acquisition, construction, and development of capital-intensive infrastructure projects (e.g., power generation, oil and gas production and distribution, industrial processes, telecommunications networks). Structural and risk allocation issues. Project finance in an international context with a focus on emerging markets. Prior enrollment in Law 280 is recommended. (Examination)

546 International Law of Human Rights (3 or 4) Shelton
An overview of international and regional human rights instruments and institutions, focusing on the manner in which the United Nations, Inter-American, European, and African human rights systems seek to protect individual and group rights. Examination of the problems these systems have encountered in discharging their mandate and exploration of ways to strengthen international and regional governmental and nongovernmental efforts in the human rights field. Prerequisite or concurrent registration: Law 520; for post-J.D. students, permission of instructor may be substituted. (Examination)

547 Regional Protection of Human Rights (3) Shelton
Advantages and disadvantages of addressing human rights issues regionally rather than at the national or global levels. The jurisprudence and procedures of the European, Inter-American, and African human rights systems. The potential for developing a regional system in parts of Asia. Prerequisite: Law 520. (Research paper)

549 Chinese Business Law (2) Clarke
Introduction to the regulatory regime governing business activity in China. Issues of concern to foreign traders and investors. Specific regulations and their implementation in practice. (Examination)

550 Law of the Sea (2) Kenney
International law related to the use of ocean space. Development of international law concerning internal waters, territorial sea, contiguous zone, high seas, continental shelf, fisheries, exclusive economic zone, maritime boundaries, marine environment, marine scientific research, deep seabed, and settlement of disputes. Current legal and policy issues associated with these areas. Prerequisite or concurrent registration: Law 520; for post-J.D. students, permission of instructor may be substituted. Credit may not be earned for both Law 550 and 551. (Examination)

551 International Law of Territory and Territorial Disputes (2 or 3)
Basic principles of international law of territory and territorial disputes, including how sovereign title to territory is acquired, transferred, and challenged, and how it is affected by demographic, historical, and political factors. Traditional and contemporary principles for resolving territorial conflicts such as the Indo–Pakistani Kashmir dispute, Iraq–Kuwait border dispute, Russo–Japanese Kurile Islands dispute, Western Sahara dispute, and Kurdish territorial disputes with Turkey and Iraq. Traditional state claims to exclusive territorial sovereignty and control versus emerging claims to territory control or rights based on self-determination, human rights, and minority rights. Credit may not be earned for both Law 550 and 551. (Examination)

552 Law of War (2) Carnahan
Human rights law in international and internal armed conflict, examining the origins of the law of war, the 1949 Geneva Conventions for the Protection of War Victims, the Geneva Protocols of 1977, the 1980 Geneva Conventional Weapons Convention, other treaties and customary international law relating to means and methods of warfare, the role of the International Committee of the Red Cross, war crimes and enforcement mechanisms, and current problems in the regulation of hostilities. Prerequisite: Law 520. (Research paper)

553 U.S. Export Control Law and Regulation (2) Calabrese
Study of U.S. laws and regulations that govern the export of defense products and dual-use civilian technologies. Examination of international export control treaties and case studies. Students participate in team exercises involving export transactions. (Examination)

554 International Criminal Law (2) Matheson
Prosecution of international crimes and application of national criminal law across international boundaries. The use of criminal sanctions to serve the objectives of the international community, particularly with respect to peace, national security, and human rights. Prior enrollment in Law 520 is recommended. (Writing assignments)

556 International Arbitration (2) Crook, Ristau
Survey of arbitration and related mechanisms of dispute resolution in the international legal system that arise out of commercial, financial, and governmental transactions. Analysis of the arbitration agreement, the process of arbitration, and the enforcement of arbitral awards as well as the common principles governing the disposition of claims. Review of the various arbitral tribunals and their rules. Prerequisite or concurrent registration: Law 520 or 522; for post-J.D. students, permission of instructor may be substituted. (Examination)

558 International Negotiations (2) G. Smith
International negotiations from a practitioner's perspective, with a focus on private-sector negotiations. The roles and interests of each of the parties to a negotiation (including private actors, lending institutions, governments and government agencies, and multinational nonprofit organizations); political and other domestic issues affecting international negotiations; practical exercises in negotiations; and multilateral negotiations. Prerequisite or concurrent registration: Law 520 or 522; for post-J.D. students, permission of instructor may be substituted. (Research paper)

560 Nuclear Nonproliferation Law and Practice (2) Jonas
The use of statutory, regulatory, national security, and international law to prevent nuclear proliferation. The Nuclear Nonproliferation Treaty, proposed Fissile Material Cutoff Treaty, International Atomic Energy Agency, Conference on Disarmament, export control regulations, arms control, and counterproliferation efforts. (Research paper)

562 Public International Law Seminar (2) Carnahan, Youmans
Selected topics in the theory and practice of international law to be announced at the time of registration. Enrollment is limited. May be repeated for credit if topic differs. Prerequisite: Law 520 or permission of instructor. (Research paper)

563 Trade Remedy Law (2) Patterson
Remedies for U.S. businesses facing competition from imports, including U.S. laws concerning antidumping, countervailing duties, and safeguards. (Research paper)

564 International Business Transactions Seminar (2) Alexandrov
Selected topics in international business law and practice to be announced at the time of registration. Enrollment is limited. Prerequisite: Law 522 or permission of instructor. (Research paper)

565 Comparative Law Seminar (2 or 3)
Selected topics in comparative law to be announced at the time of registration. Enrollment is limited. (Research paper)

567 Human Rights Advocacy Seminar (2) Carrillo
Focus on fundamental lawyering skills in the context of the transnational setting of human rights advocacy, including research and writing, interviewing and counseling clients, fact development, case planning, professional responsibility, and oral advocacy. Clinical exercises drawn from the human rights context. Corequisite: Law 633; prerequisite: Law 520, 546, or 568 or completion of the GW–Oxford International Human Rights Law Program. (Simulation)

568 Human Rights Lawyering (2 or 3) Carrillo
Examination and assessment of the role of lawyers in the articulation and implementation of international human rights law. Topics include theories and methods of investigation and fact-finding; interpretation and application of law; choice of remedies and strategies for case development; and the nature of human rights

law practice on behalf of governments, intergovernment organizations, and nongovernmental organizations. Students participate in role plays and work on cases and applied projects submitted by the United Nations and inter-American and other intergovernment organizations, and by international nongovernmental organizations. (Examination or research paper with permission of the instructor)

Law and Other Disciplines

590 Jurisprudence (2 or 3) Galston, Mitchell
Basic jurisprudential concepts; nature of law; development of legal institutions; jurisprudential schools—natural law, analytical, historical, sociological, functional; law and logic; law and justice; the judicial process; legislative, executive, administrative decision making; impact of politics, economics, and scientific advance on legal systems; contemporary trends in jurisprudential thought. (Examination)

591 U.S. Legal History (2 or 3) Cottrol
Examination of the history of U.S. law from the seventeenth century to the present. Topics include Anglo-American constitutionalism, the reception and transformation of the common law, slavery and the law, race and gender in U.S. law, corporations, labor and the rise of the regulatory state, and legal education and the legal profession in U.S. history. (Research paper)

592 Jurisprudence Seminar (2 or 3)
Selected topics in legal theory to be announced at the time of registration. Enrollment is limited. (Research paper or examination)

593 Professional Responsibility and Ethics Seminar (2)
Selected topics in professional responsibility and ethics. Intensive study of questions of lawyer responsibility and ethics raised by professional codes and moral philosophy. Prerequisite: Law 218. Enrollment is limited. (Research paper)

594 History of the U.S. Constitution (2 or 3) Wilmarth
Examination of the philosophical and historical background of the U.S. Constitution, including the writings of Locke and Montesquieu, with particular attention to social contract theory, natural law, and separation of powers principles. Consideration of the relevance of these concepts to the debates surrounding the drafting and ratification of the Constitution and the original Bill of Rights, and the degree to which these concepts have been reflected in decisions of the Supreme Court, including selected decisions of the Marshall Court and several more recent decisions. (Examination or research paper with permission of the instructor)

595 Race, Racism, and American Law (2 or 3) Butler
Examination of the influence of race and racism on the development of law in the United States. The use of law by legislatures and judges, both to enforce and to remedy racism in selected contexts, possibly including criminal justice, voting rights, public accommodations, education, employment, housing, free speech, and family law. The course will also consider the utility of critical race theory as a method of legal analysis. (Examination)

596 Law of Race and Slavery (2) Cottrol
The role of legal norms and processes in developing patterns of slavery and race relations in the United States and other societies. Application of themes and methods from comparative and historical sociology to the study of legal history. Topics include the legal origins of slavery in the Americas, law and racial classifications, social and economic consequences of legal discrimination, and legal remedies and the undoing of systems of discrimination. Comparative study of the history of race relations in the United States, Latin America, and South Africa. Enrollment is limited. (Research paper)

597 Legal History Seminar (2 or 3) Lerner, Tsuk
Selected topics in legal history to be announced at the time of registration. Enrollment is limited. (Research paper)

598 Law and Economics (2 or 3) Rubin
An introduction to the main features of the "Law and Economics" movement, with particular attention to the content, application, and criticisms of the Coase theorem. Topics include a brief review of essential aspects of price theory (including the concept of a competitive price equilibrium), an introduction to

the principal notions of welfare optimality (including Pareto and Hicks–Kaldor efficiency), and the problems posed by externalities and public goods. Emphasis on some of the classical works in this field and applications to specific decisions. (Examination)

602 Law and Accounting (2 or 3) Wyrsch
Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items in financial statements of corporations; inventory adjustments; corporate transactions, distributions, capital adjustments. Strongly recommended for students who have had no accounting. (Examination and problem assignments)

604 Quantitative Analysis for Lawyers (2 or 3) Halpern, Cavanaugh
Introductory course for lawyers that does not assume or require advanced mathematical skills. Application of non-legal methods of analysis in public policy problems with attendant evidentiary requirements, including the effective use of experts. Principal non-legal methods of policy analysis, including microeconomic analysis (basic price theory and industrial organization), financial analysis (including the roles of financial institutions), and statistical analysis. Introduction to basic analytic concepts and terminology/jargon, common applications of the analysis in the law, and practical problems of expert witnesses. (Examination or research paper with permission of the instructor)

606 Law and Literature (2) Solove, Schaller
The law in literature and as literature, including approaches to the interpretation of legal and literary texts. Richard Posner's *Law and Literature* provides background for weekly readings from Aeschylus, the Pearl Poet, Shakespeare, Melville, Twain, Trollope, Kafka, Faulkner, Robert Bolt, Nella Larson, and Susan Glaspell, among others, and commentary by academics such as Robin West, Ronald Dworkin, Richard Weisberg, Stanley Fish, and Sanford Levinson. (Research paper and oral presentations)

608 Feminist Legal Theory (2) Ridder
Law and society studied from the point of view of women. The course focuses on feminist jurisprudential treatment of gender and examines the prospects for sex equality under the law. Enrollment is limited. (Research paper)

612 Law and Anthropology (2) Palmer
Cultural aspects of law in the context of various societies. Traditional African dispute resolution and the changes brought about by colonialism; Native American political structures; Gypsy courts; the relative legal rights of insiders and outsiders in small-scale European communities; non-legal resolution of disputes in urban neighborhoods in the United States. Legal rules and cultural traditions of these and other societies compared in terms of economic efficiency, personal responsibility and freedom, and ethical balance. (Research paper)

614 Law and Psychiatry (2) Blackmon
Overview of psychiatry as a medical discipline and examination of its use in a legal setting. Focus on informed consent, confidentiality, criminal responsibility and legal insanity, civil competency, and commitment. Topics include psychiatric testimony in court, psychiatric illness as a disability, and the impact of managed care on current practices in mental health law. Prior enrollment in Law 230, 360, and 380 is recommended. (Take-home examination)

615 Law and Psychology (2) Kirkpatrick
The intersection of law and psychology. Eyewitness identification, polygraph evidence, hypnotically refreshed memory, recovered memory, syndrome and profile evidence, jury selection, jury decision making, standards of expert testimony, and predicting dangerousness. (Research paper).

616 Genetics and the Law (2 or 3) Suter
Examination of the legal and ethical issues that genetics research and technology present. Topics include eugenics; the Human Genome Project; ethical, legal, and regulatory issues associated with clinical genetics and various types of genetic testing; possible discriminatory uses of genetic information by employers, insurers, and others; legislative attempts to protect the privacy and confidentiality of genetic information; ownership of genetic samples and information; patent law issues; forensic uses of genetic information; gene therapy; and cloning. (Take-home examination)

617 Law and Medicine (2 or 3) Rabecs

Examination of legal and ethical issues that arise in the doctor–patient relationship and medical decision making. Topics include informed consent; human experimentation; personhood; reproduction, including advanced technologies and prevention; patients' rights; death, dying, and limits on intervention; hard choices; and public policy issues. (Take-home examination)

Clinics

620 Consumer Mediation Clinic (2 or 3) Izumi

Students act as neutral third parties who help local consumers resolve disputes with businesses by facilitating mediated agreements. Students perform intake interviews, provide information and referrals, identify interests and priorities of the parties, generate and narrow options, and craft settlement terms. Student-mediators develop problem-solving techniques as they learn about federal and state consumer laws. For 2 credits, students devote 10 hours per week to clinical work, including phone hours, attend a required weekly two-hour seminar, and present a brief paper analyzing one mediation case. Students may earn 1 additional credit by participating in the Community Dispute Resolution Center, a joint project of the Law School and the non-profit Center for Dispute Settlement. Students conduct co-mediations of interpersonal disputes referred by community agencies and organizations. Requirements for this component include an additional 4 hours per week of clinical work, attendance at an intensive training session during a weekend before commencing co-mediations, preparation of brief writings on co-mediations, and participation in out-of-class videotaped simulations. Open to second- and third-year students. Permission of the instructor required prior to registration. The grade of *H, P, LP,* or *NC* is given for this course. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

621 Small Business Clinic (2, 3, or 4) Jones

Under the supervision of the instructor, students assist small businesses and nonprofit organizations with a wide variety of legal issues, including drafting incorporation and partnership papers (such as articles of incorporation and bylaws), compliance with local licensing requirements, reviewing and drafting contracts and leases, advising on tax problems and related matters; 15–20 hours of work per week required. Prerequisite: Law 250 and 300 and permission of instructor. The grade of *H, P, LP,* or *NC* is given for this course. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

622 Public Justice Advocacy Clinic (3 or 4) Gutman

Under faculty supervision, students undertake public interest litigation and legislative or administrative advocacy on behalf of low-income clients. Student responsibilities include factual development, legal analysis, drafting of pleadings, discovery and motions, and negotiating settlements in cases filed in local or federal court. Third-year students may participate in oral arguments if certified pursuant to applicable D.C. Court of Appeals and Federal District Court rules. Students may also work with nonprofit and community organizations to present positions in legislative fora and in regulatory rulemaking matters pending before administrative agencies. Open to second- and third-year students. Students are encouraged to take this course for two semesters. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

624 Civil Litigation Clinic (4) Strand

Open to third-year students. Participants represent indigent litigants in D.C. Superior Court. Students are exposed to a range of cases in the Family Division (divorce, custody, child support, alimony), and the Civil Division (small claims, negligence, consumer, property disputes). Responsibilities include client interviewing, investigation, settlement negotiations, drafting of initial pleadings and motions, as well as conducting actual hearings and trials. Students must have 16 to 20 hours per week to devote to this clinic. Participation is by permission of the instructor; applications must be submitted during the spring of the preceding academic year. Prerequisite: Law 230 and 360. Law 640 is strongly recommended. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

625 Federal, Criminal, and Appellate Clinic (4) Lyman, Olesen
Under supervision of the instructor, third-year students litigate appellate cases, primarily direct appeals from criminal convictions in area courts of appeal. Student responsibilities include development of the lawyer/client relationship, record review and selection of issues, briefing, and oral argument. A weekly seminar addresses the lawyer's role, ethical and procedural problems, litigation strategy, and criminal justice issues through role-playing, simulation, and written exercises. Student work loads fluctuate, but average about 20 hours per week. Enrollment is by permission of the instructor, and applications must be submitted during the spring of the preceding academic year. Must be taken for the full academic year; 8 graded credits are awarded at the end of the spring semester. Prerequisite: Law 230 and 360; Law 650 is recommended. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

626 Vaccine Injury Clinic (4) Meyers
This clinic allows approximately ten second- and third-year students, under faculty supervision, to represent individuals who have suffered serious vaccine-related injuries and who are seeking damages in trial and appellate proceedings before the U.S. Court of Federal Claims. A weekly two-hour seminar will focus on multidisciplinary (medical/legal) training in vaccine injury issues, and on lawyering skills such as client interviewing and counseling and cross examination of medical experts. Students will also evaluate Claims Court's program as a model for tort reform. Students must devote approximately 16 hours per week to the clinic, and participate in both the fall and spring semesters. Four hours of graded credit are given for each semester. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

627 Environmental Law Clinic (2 or 3) Turley
Second-, third-, and fourth-year students participate in the J.B. and Maurice C. Shapiro Environmental Law Clinic, representing clients in environmental litigation in both the federal and state systems. Students work under faculty supervision in administrative, trial, or appellate actions, particularly citizen suit actions. This work includes actions under the Clean Air Act, the Clean Water Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Endangered Species Act, the Resource Recovery and Conservation Act, and the Federal Facilities Compliance Act. Permission of the instructor is required prior to registration. Two or 3 hours of graded credit are given for this course. Prerequisite or concurrent registration: Law 430. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

630 Immigration Clinic (3) Benítez
Students assume substantial responsibility for handling a range of immigration law matters, including determining what benefits or forms of relief, if any, are available to their clients, and, in appropriate circumstances, representing their clients in removal proceedings. Because the Clinic's clients come from all over the world, cultural sensitivity is essential and foreign language skills are welcome. A minimum of 210 hours of work per semester and attendance at a two-hour weekly seminar are required. Permission of the instructor is required prior to registration. Prerequisite: Law 538. Students may enroll in this course and Law 668 only with permission of both instructors.

631 Health Law Rights Clinic (2) Jackson
Under faculty supervision, second- and third-year students provide advice and information and assist in providing legal representation to older D.C. residents who are having difficulty with medical bills, Medicare, Medicaid, and other health insurance problems. Students perform two hours of intake at the office or by home visit each week, attend the weekly two-hour health insurance seminar, and take major responsibility for up to five cases during the semester. Areas of legal representation include Medicaid, "Medigap" insurance, HMO or managed care coverage under Medicare; appeals regarding denial of payment for hospital or home health care before the utilization review organization or an appropriate judicial forum; negotiating with collection agencies and billing offices regarding payment of medical bills. Student should expect to devote 10 hours per week to this course. The grade of *H*, *P*, *LP*, or *NC* is given for this course. Students

may enroll concurrently in this course and Law 668 only with permission of both instructors.

632 Administrative Advocacy Clinic (2 or 3)
Under faculty supervision, second- and third-year students represent low-income and elderly clients before federal and D.C. administrative agencies and, on occasion, in court. Students have primary responsibility for interviewing and counseling clients and using oral and written advocacy skills to advance claims informally and in administrative hearings. Students work in the areas of Social Security, disability, food stamps, AFDC, and other public entitlement programs. Students also draft wills, powers of attorney, and other legal documents. Participants in the clinic are expected to work eight hours per week and attend a two-hour weekly seminar. Because of federal conflict of interest rules, students generally may not participate in the clinic while employed, with or without pay, by the federal government. The grade of *H*, *P*, *LP*, or *NC* is given for this course. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

633 International Human Rights Clinic (4) Carrillo
Under faculty supervision, students work in a clinical setting in partnership with experienced attorneys and specialized institutions engaged in human rights activism on case projects drawn from one of two principal areas: (1) litigation and advocacy before international human rights tribunals and treaty bodies, primarily in the Inter-American and United Nations human rights systems; or (2) human rights litigation and advocacy in the United States, especially in relation to the Alien Tort Claims Act and the Torture Victims Protection Act. Corequisite: Law 567; prerequisite: Law 520, 546, or 568 or completion of the GW–Oxford International Human Rights Law Program.

634 Law Students in Court (4) Hay
A clinical program in trial advocacy, offering an opportunity to develop skills as a trial lawyer while representing indigent persons in the Superior Court of the District of Columbia. Students may participate in either the civil division (which focuses primarily upon the representation of tenants in landlord–tenant actions, but also handles some consumer, negligence, and other civil matters) or the criminal division (in which student litigators defend persons charged with misdemeanor offenses). Students in both divisions have the opportunity to participate in jury trials. They are responsible for all aspects of litigation under the supervision of clinical instructors: interviewing clients and witnesses, conducting investigations, preparing pleadings, engaging in settlement negotiations or plea bargaining, and conducting all motions hearings and trials pursuant to the Superior Court's third-year practice rule. Only third-year students who have completed Law 230 and 360 may participate in the clinic. Seminars are held in the civil division on Monday evenings and in the criminal division on Thursday evenings. Students must have one day per week available for court appearances and plan to devote approximately 20 hours per week to the clinic. Students must participate in the program for two consecutive semesters, beginning in either the summer or fall. Application must be made during the spring semester of the preceding academic year. This course may not be taken at the same time as Law 624 or any litigating activities in Law 632. Students may enroll concurrently in this course and Law 668 only with permission of both instructors. Enrollment is limited, with selection by lottery. This course is graded on a *CR/NC* basis.

635 Disabled People and the Law (2) Banzhaf
Examination of those areas in which persons with disabilities have traditionally been denied some right or benefit afforded other persons in our society and have resorted to legal action; introduction to statutes and agencies designed to protect people with disabilities. Students may choose to prepare a research paper (and receive legal writing credit and a numerical grade) or to gain practical experience doing a clinical project (on a *CR/NC* basis). Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

636 Law and the Deaf (1, 2, or 3) Banzhaf
Work with the National Association for the Deaf in bringing legal information, services, and representation to the 28 million Americans who are deaf or hearing-

impaired. The Association is designed to help make the hearing-impaired aware of their legal rights and to assist them in solving their legal and law-related problems. Students may participate in one or more projects: (1) counseling persons with hearing impairments about legal problems at a walk-in clinic usually held on the Gallaudet College campus; (2) preparing and participating in workshops for hearing-impaired persons to acquaint them with their rights and obligations under the law; (3) assisting in representing the interests of deaf and hearing-impaired persons in judicial and administrative proceedings; (4) preparing research papers on topics related to law and the deaf or preparing handbooks explaining legal topics to the hearing-impaired. Students may learn some sign language but will be assisted by trained translators when dealing with deaf individuals. Approximately 60 hours of work per semester is required for each credit hour. Students may repeat this course for a maximum of 8 credit hours of credit. This course may not be taken at the same time as Law 634 or any litigating activities in Law 632. Students may enroll concurrently in this course and Law 668 only with permission of both instructors. This course is graded on a *CR/NC* basis.

637 Legal Activism (2 or 3) Banzhaf

Study of the legal process, not to benefit individual clients, but as a powerful tool for affecting social change and advancing the public interest. Topics discussed in a two-hour seminar meeting each week include principles of maximizing legal leverage, legal judo, guerrilla law, working with the press and members of Congress, drafting of legal documents, unusual legal tools and tactics, negotiation, making money from public interest law, etc. Students may choose to bring a public interest legal action before an agency or in court or may undertake another legal action project for 3 credits and receive a numerical grade. Alternatively, students may do research on a topic related to public interest law for 2 credits on a *CR/NC* basis. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

638 Intensive Clinical Placement (arr.) Staff

Projects involving litigation, research, or public interest activities of a legal nature (including aid to indigents, support of public interest nonprofit corporations, and support of governmental agencies or courts) may be initiated and will be supervised by a faculty member. Projects must be approved in advance by the Law School Supervisory Committee (three members) both as to whether the project is appropriate and as to the number of credit hours to be granted. A maximum of 10 credit hours may be taken in one or two semesters. This course is open to a limited number of third-year students. This course is graded on a *CR/NC* basis. Students may enroll concurrently in this course and Law 668 only with permission of both instructors.

Skills and Simulation Courses

640 Trial Advocacy (3) Saltzburg, Eubanks, Gierke, Gilligan, Horn, Leonard, Masurovsky, Rankin, Schreiber, Urbina

Pretrial and trial techniques with emphasis on procedural, evidentiary, tactical, and ethical problems experienced by trial lawyers in actual cases. Complaint drafting, pretrial motions, depositions and other discovery methods, preparation of witnesses, jury selection, the use of experts, direct and cross-examination, introduction of documents, courtroom techniques, and opening and closing arguments. Role playing in simulated courtroom situations. Once registered, no student may drop this course without the express permission of the dean of students. Prerequisite: Law 230; Saltzburg—students may be enrolled concurrently in Law 230. Enrollment is limited. (Short papers and exercises)

642 Alternative Dispute Resolution Competition (1) Johnson

Participants in interscholastic ADR competitions may register for this course and receive 1 credit for each competition in which they participate. A student who advances from a regional to a national competition must register for this course again to receive 1 additional credit for participation in the national. All students competing must complete and submit an Intent to Compete form available in the Student Affairs Office. In no event may a student receive more than a total of 3 credits for intra- and interscholastic competitions under Law

642, 644, and 645. Once registered, no student may drop this course without permission of the dean of students. This course is graded on a *CR/NC* basis.

643 Pre-Trial Advocacy (2 or 3) A. Robinson, Rhoad

Pre-trial and trial techniques of civil discovery and motions practice by role-playing in simulated cases. The class is divided into "law firms" that represent clients in cases at the pre-trial stage. Students are required to attend pre-trial conferences and conduct extensive discovery, including conduct of depositions, argument on discovery motions to compel or sanctions, preparation and service of interrogatories, requests for production, requests for admissions, and motions for physical and mental examinations. The course ends with a five-hour mock trial by jury. (Simulation and paper)

644 Moot Court (1) Johnson

The Moot Court Board sponsors four upper-level, intrascholastic competitions each year: the Van Vleck Constitutional Law Moot Court Competition, the Jessup International Law Moot Court Competition, the Giles S. Rich Intellectual Property Law Moot Court Competition, and the Government Contracts Moot Court Competition. Participants earn 1 credit for each competition in which they participate, regardless of how they finish. Participants in the Jessup Competition and the Giles S. Rich Competition who compete in the regional rounds must register for this course again, and receive 1 credit in addition to the credit earned for participating in the in-house competition. All students competing must complete and submit an Intent to Compete form available in the Student Affairs Office. Only current members of the Moot Court Board may petition to receive Moot Court Board funds to attend external competitions, unless approval is otherwise granted by the dean of students. In no event may a student receive more than a total of 3 credits for intra- and interscholastic competitions under Law 642, 644, and 645. Once registered, no student may drop this course without permission of the dean of students. This course is graded on a *CR/NC* basis.

645 Mock Trial Competition (1) Johnson

The Mock Trial Board sponsors the intrascholastic Cohen & Cohen Mock Trial Competition in the fall semester. The competition offers students an opportunity to practice trial skills and serves as a basis for selection of teams to represent the Law School at various interscholastic trial competitions. The competition requires a two-person team to prepare a written trial brief and argue its case before a judge and jury. The competition also provides a seminar on trial advocacy skills, strategies, and techniques. Students who participate in the fall competition receive 1 credit. Those students attending interscholastic trial competitions must register for this course again, and receive 1 credit for each competition in which they participate. All students competing must complete and submit an Intent to Compete form available in the Student Affairs Office. Under no circumstances may a student receive more than a total of 3 hours of credit for intra- and interscholastic competitions under Law 642, 645, and 644. Once registered, no student may drop this course without permission of the dean of students. This course is graded on a *CR/NC* basis.

646 Mediation (2) Garrett, Juliano, Ray, Roscoe, Wind

Consideration of the growing use of mediation to resolve disputes and comparison with other dispute resolution processes. Taking the roles of mediators and disputants, students participate in a number of simulations. Mock mediations are conducted individually and with a co-mediator. Examination of practical and ethical issues; applicability to various substantive areas including contract, tort, consumer, family, criminal, discrimination, and landlord/tenant. Students are expected to fill out role-playing evaluations of themselves and classmates on a regular basis and to write a 15-page paper (which does not count toward fulfilling the legal writing requirement) discussing a particular application of mediation or other dispute resolution process or an ethical or legal question involving mediation. Class attendance is mandatory. Enrollment is limited. Students may take both Law 646 and 647 from the same instructor only with the instructor's permission.

647 Alternative Dispute Resolution (2 or 3) Hoffman, Sylvester

Theoretical and practical aspects of negotiating and mediating transactions and disputes. Techniques studied include neutral evaluation, regulatory negotiations, mini-trials, settlement judge approaches, arbitration, and other "hybrids."

Students participate in a number of simulated disputes related to various practice areas, both in and outside of class. Enrollment is limited. Students may take Law 647 and either 646 or 648 from the same instructor only with the instructor's permission. (Role playing and written assignments)

648 Negotiations (2 or 3) Craver, A. Abramowitz, Costantino, Drucker, Haythe, Ray, Sylvester

Examination of the negotiation process employed by legal practitioners. The assigned text considers the negotiation process, negotiating techniques, verbal and nonverbal communication, and other factors that influence these interpersonal transactions. Students engage in negotiation exercises that enable them to practice the art of negotiating and to examine their personal strengths and weaknesses. Grades are determined in meaningful part by the results obtained, vis-a-vis other class members, from these exercises. Students are also required to prepare a short paper on a topic pertaining to the negotiation process. Enrollment is limited. Students may take both Law 648 and 647 from the same instructor only with the instructor's permission.

650 Client Interviewing and Counseling (2) Boss, Ginsburg, Kemler, Sullivan

Practice with gathering and evaluating facts supplied by clients, followed by presentations of advice based on consideration of facts and applicable law. Discussion of interpersonal aspects of client relations and ethical problems that may arise in the context of client interviews. Students participate in simulated interviews, portraying both clients and attorneys. A paper discussing some aspect of the interviewing and counseling process is required. Enrollment is limited. (Simulation and paper)

652 Legal Drafting (2) Beattie, Guberman, Hall, Johnson, Kremers, Ng, E. Shapiro, Ward

Students learn the fundamental skills necessary to draft litigation and transactional documents. Practical application of the drafting process to the preparation of litigation documents, such as pleadings and motions, and transactional documents, such as contracts, deeds, wills, or other agreements. Topics include planning and structuring a document, legal research strategies, the role of procedural rules, plain language initiatives, and ethical principles that affect the drafting process. (Drafting projects and short writing exercises)

653 Advanced Appellate Advocacy (2) Bronston, Lackey

Intensive study of appellate process, brief writing, and argumentation. Focus on techniques for creating and structuring an appellate brief and developing effective arguments to support a client's position and refute an opposing party's position on appeal. Topics include developing a theory of the case and developing arguments based on precedent. Strategic considerations of appellate briefs and effective oral argument. (Appellate briefs and oral argument)

654 Law and Rhetoric (2 or 3) Kryvoruka

Consideration of the usefulness and application of classical and contemporary rhetorical theory in legal arguments. The structures and strategies of argument and persuasion applied to the legal context. Judicial opinions, appellate briefs, and legal scholarship are examined toward an understanding of rhetorical strategies. (Papers and short writing assignments)

655 Advanced Legal Research (2) Pagel, Reed

Intensive review of legal research tools and methods involving both traditional and automated resources. General categories of materials (reporters, codes, etc.) and their place in contemporary law practice; methods of conducting research in specific areas of the law. (Research assignments and paper)

656 Independent Legal Writing (1 or 2) Staff

Preparation of a research paper under the supervision of a member of the faculty who will determine, prior to registration, whether the work required for the topic justifies 1 or 2 credit hours. If elected for 1 credit hour, this course may be repeated to meet the legal writing requirement for the J.D. degree. Approval by the faculty supervisor is required prior to registration; if the faculty supervisor is a member of the part-time faculty, approval is also required from the senior associate dean for academic affairs or associate dean for academic affairs.

Compliance with the Legal Writing Requirement as outlined in this Bulletin is necessary if the course is used to satisfy that requirement. Students may not take more than a total of 2 credits in this course under the supervision of part-time faculty members. (Research paper)

658 Law Review (1, 2, 3, or 4) Clark
Limited to members of the student staff of the *Law Review*. A maximum of 4 credit hours may be earned in this course. Second-year students must enroll concurrently in Law 664. This course is graded on a *CR/NC* basis.

659 International Law Review (1, 2, 3, or 4) Steinhardt
Limited to members of the student staff of the *International Law Review*. A maximum of 4 credit hours may be earned in this course. Second-year students must enroll concurrently in Law 664. This course is graded on a *CR/NC* basis.

661 Public Contract Law Journal (1, 2, 3, or 4) S. Schooner
Limited to the members of the student staff of the *Public Contract Law Journal*. J.D. candidates may earn a maximum of 4 credit hours and LL.M. candidates may earn a maximum of 2 credit hours in this course. Second-year students must enroll concurrently in Law 664. This course is graded on a *CR/NC* basis.

662 Intellectual Property Law Journal (1, 2, 3, or 4) Schaffner
Limited to members of the student staff of *The American Intellectual Property Law Association Quarterly Journal*. A maximum of 4 credit hours may be earned in this course. Second-year students must enroll concurrently in Law 664. This course is graded on a *CR/NC* basis.

664 Scholarly Writing (1) DeSanctis
Introduction to writing for scholarly legal journals. Topic selection, research strategies, organization, style, grammar, usage, and the editing process. This course is a corequisite for second-year students enrolled in Law 658, 659, 661, or 662. The grade of *H, P, LP,* or *NC* is given for this course.

666 Research and Writing Fellow (2) DeSanctis
Limited to students selected to assist in teaching first-year *Legal Research and Writing* (Law 216) and *Introduction to Advocacy* (Law 217). Two credit hours may be earned in both the fall and spring semesters. This course is graded on a *CR/NC* basis.

Outside Placement

668 Outside Placement (1, 2, 3, or 4) Brittingham
Students earn academic credit for externship placements in public interest, government, and nonprofit organizations located within the Washington, D.C., metropolitan area. A compilation of possible placements is available from the director of the outside placement program. Placements must receive prior approval by the director of the program. Students enrolled in this course must fulfill a classroom component requirement by enrolling concurrently in Law 669, 670, 671, 672, 674; in another course in the Law School curriculum and Law 673, as determined by the director of the program; or in Law 656. Students who have previously completed a corequisite in the area of law relevant to the current placement may be exempt from the corequisite requirement at the discretion of the director of the program. Students may enroll concurrently in this course and any other clinical course only with the permission of both instructors. This course is graded on a *CR/NC* basis. Students may earn no more than 8 credits in this course. Students participating in the Domestic Violence Project under the supervision of Professor Joan Meier must register for this course for 2 to 4 credits and enroll concurrently in Law 674. Permission of the program director is required prior to registration in this course and the corequisite courses.

669 The Craft of Judging (2) Alprin, Burgess, Campbell, Canan
Focus on current issues in judicial ethics, judicial administration, and the trial and appellate process. Topics include standard of review, statutory interpretation, the role of precedent, and judicial activism. This course is corequisite for students enrolled in Law 668 in a judicial intern placement, as determined by the director of outside placement. Students not concurrently enrolled in Law 668 may take this course only with the permission of the instructor. Enrollment is limited. This course is graded on a letter-grade basis. (Writing assignments)

670 Public Interest Lawyering (2) Runge
Examination of the role of the public interest lawyer. Topics include the lawyer's role and responsibilities in different branches of government and in public affairs, both historically and currently; ethical issues; identification of public interest clients and the potential for conflicts of interest among them; organizational settings; and the politics of public interest lawyering. This course is corequisite for students enrolled in Law 668 in a public interest placement, as determined by the director of outside placement. Students not concurrently enrolled in Law 668 may take this course only with the permission of the instructor. Enrollment is limited. This course is graded on a letter-grade basis. (Writing assignments)

671 Government Lawyering (2) DeVigne, Axelrad, Corrigan, A. Goelman
The role of the lawyer in federal government agencies. Topics include agency adjudication and rulemaking; judicial review; enforcement; regulatory reform; the role of the office of general counsel; alternative dispute resolution; the Freedom of Information Act; and congressional relations. This course is corequisite for students enrolled in Law 668 in a government agency placement, as determined by the director of outside placement. Students not concurrently enrolled in Law 668 may take this course only with the permission of the instructor. Enrollment is limited. This course is graded on a letter-grade basis. (Research paper)

672 The Art of Lawyering (2) Freeman
Issues concerning the nature of the legal profession, its institutions, and its members. Topics include the diverse organizations in which law is practiced, ethical dilemmas, workplace culture, supervision, and career expectations. This course is corequisite for students enrolled in Law 668, as determined by the director of outside placement. Students not concurrently enrolled in Law 668 may take this course only with the permission of the instructor. Enrollment is limited. This course is graded on a letter-grade basis. (Writing assignments)

673 Outside Placement Tutorial (1)
Students enrolled in Law 668 whose required classroom component is being fulfilled by a course designated by the director of outside placement other than Law 669, 670, 671, 672, or 674 must also register for this course and write a research paper under the supervision of the instructor of the designated course. This course is graded on a letter-grade basis. (Research paper)

674 Domestic Violence Project (2) Meier
Exploration of issues in social change lawyering in the battered women's movement. Topics include the role of lawyers in the development of the battered women's movement in the 1970s, major legal reforms of the past three decades, and the challenges for lawyers seeking to create change in this field. This course is corequisite to Law 668 for students enrolled in a placement consisting of trial work with a local legal service provider on domestic violence cases, policy or legislative work with a national organization on domestic violence issues, or appellate work with attorneys in law firms conducting pro bono domestic violence appeals. Students not concurrently enrolled in Law 668 must have the instructor's permission to register for this course. (Writing assignments)

Graduate Courses in Litigation and Dispute Resolution

675 Advanced Trial Advocacy (3) Winston, Wright
Students learn to conduct a civil, criminal, or administrative trial before a jury or judge in a professional and effective manner. By engaging in simulated courtroom situations followed by specific critiques and recommendations for improvement, students learn to present persuasive opening statements and closing arguments, to conduct forceful direct and cross-examination of fact witnesses and experts, and to introduce successfully all types of exhibits. By reference to examples, students also become familiar with the ethical, evidentiary, procedural, and substantive aspects of litigation. The course will emphasize practical solutions to typical problems litigators encounter in the presentation of a case. At the conclusion of the course, students will undertake the trial of a simulated case from opening statement through jury deliberation before a judge or very experienced litigator. Enrollment is limited. Open to LL.M. students. (Simulation)

676 Mediation and Alternative Dispute Resolution (3) Garrett, Wind
An introduction to alternative dispute resolution, with a focus on the many ways in which ADR can be used effectively by the advocate. Issues include determining whether ADR is appropriate in a given case, the timing of an ADR process, and the type of process that should be used. The role of the advocate during a mediation or other dispute resolution process, e.g., the selection of the neutral, preparing for a mediation, and the advocate's participation in the mediation itself. Emphasis on the mediation of civil cases, with a briefer discussion of the use of ADR in the criminal justice context. Enrollment is limited. Open to LL.M. students. (Simulation)

677 Pre-Trial Practice in Civil Cases (3) A. Robinson, Rhoad
Students in this simulation course are divided into law firms and assigned roles that correspond to the pre-trial tasks lawyers routinely are called upon to perform in civil cases. The exercises begin with discovery, and students attend a Fed.R.Civ.P.26(f) meeting, dealing with required disclosures and other preliminary discovery matters. Students prepare discovery motions and responses, take and defend depositions, file dispositive motions, attend a pretrial conference, and prepare a joint pretrial memorandum. By the end of the course, each student will have simulated moving a case from the filing of a complaint to the eve of trial. Enrollment is limited. Open to LL.M. students. (Simulation)

678 Ethics in Adjudication and Settlement (3) Burger, Schaller
Consideration of ethics issues that come into play once disputes have arisen and litigation has either commenced or been threatened. Examination of the ethical rules that govern threats to sue and responses to such threats, and the rules that are particularly important once litigation has commenced. Each class focuses on a hypothetical problem involving an ethical issue or set of issues. In each hypothetical, the lawyer's duty to the client and the lawyer's duty to the court are explored through role playing. Enrollment is limited. Open to LL.M. students. (Simulation)

679 Advanced Evidence (3) Gilligan
How the rules of evidence can be used to build and present a case more effectively. Topics include an overview of the theory and philosophy of the rules of evidence; the scope of the attorney–client privilege in corporate and government litigation; joint defense agreements; the role of vicarious admissions in civil and criminal litigation; hearsay; expert evidence; character evidence rules; motions in limine; impeaching witnesses; laying foundations; exhibits and charts; and the evidentiary difference between bench and jury trials. Enrollment is limited. Open to LL.M. students. (Simulation)

680 The American Jury (3) Mott, Urbina
Focus on a variety of issues that arise in civil and criminal jury trials in federal and state courts in the United States. Topics include separating judicial from jury functions; the jury pool; the grand jury; jury voir dire; challenges for cause and peremptory challenges; scientific jury selection: jury instructions; verdict forms; presentation of evidence; jury nullification; improving juror participation; impeaching verdicts; and high-publicity trials. Enrollment is limited. Open to LL.M. students. (Simulation)

681 Negotiation and Conflict Management Systems Design (3) Horn
Analysis of negotiation techniques, verbal and nonverbal communication, and other factors that influence interpersonal communication in a typical negotiation. Introduction to the theories, principles, and practices of organizational development and dispute systems design. Focus on strategies for designing systemic approaches to resolve a cluster or stream of disputes in particular organizations or institutions, including government agencies, educational and health care settings, corporations, and nonprofit organizations. The concept of "negotiating" with clients in order to develop effective conflict management systems. Students' experience with institutional clients and with individual efforts to manage conflict forms the framework for some class discussions. Enrollment is limited. Open to LL.M. students. (Simulation)

682 International Dispute Resolution (3) A. Robinson, Bowen
Development of complex dispute cases involving multiple parties. International case law and conventions, including jurisdiction, forum selection, comity, enforce-

ment, and application and proof of foreign law. Students work in teams to prepare motions, gather evidence, interview and depose fact and expert witnesses, interview clients, develop and present opening and closing arguments, and conduct direct and cross examination of lay and expert witnesses. Simulation exercises include adjudication of disputes through role playing and preparation and participation in a mock trial. Enrollment is limited. Open to LL.M. students. (Simulation)

683 The College of Trial Advocacy (3) Saltzburg
An intensive, six-day course focusing on trial simulation and role playing. A varying panel of experienced lawyers and judges discuss and demonstrate trial skills and ethics, and oversee and critique small-group simulations by students in making opening and closing statements and in conducting direct and cross-examination of experts and other witnesses. Enrollment is limited. Open to LL.M. students. (Simulation)

684 Pre-Trial Practice in Criminal Cases (3) Weinberg
Students in this course are assigned alternating roles as prosecutor and defense counsel in order to simulate the pre-trial tasks lawyers routinely perform in criminal cases. Simulation exercises begin after the arrest of the suspect, with student–prosecutors conducting a preliminary investigation and student–defense counsels interviewing the defendant. Thereafter, students conduct and attend grand jury proceeding, arraignments, bail hearings, preliminary hearings, suppression hearings, plea bargaining sessions, and plea hearings before the trial judge. Students conduct discovery and file pre-trial motions and responses. By the end of the course, each student will have simulated moving a case from arrest to the eve of trial. Enrollment is limited. Open to LL.M. students. (Simulation)

Special Courses for Graduate Law Students

690–91 Thesis (2–2) Murray
Students must register for two consecutive semesters and cannot register for both courses in one semester. In addition to identifying a member of the full-time faculty to serve as thesis adviser, students are required to attend scheduled class sessions, which cover issues such as topic selection, specialized research, and the process of organizing and writing the thesis.

694 Fundamental Issues in U.S. Law (2 or 3) Karamanian
Required for graduate students who do not hold a law degree from a U.S. academic institution, this course consists of 2 credit hours of instruction in fundamental topics in U.S. law (e.g., constitutional law, torts, contracts, civil procedure, conflicts of law) and 1 credit hour of instruction in research techniques and legal writing. The director of the International and Comparative Law program may waive the 1-credit portion of the course for students who have been determined to have the requisite research and writing skills; such students will earn 2 credits for this course. (Examination)

695 Legal Practicum (0) Karamanian
Students independently arrange paid positions with outside organizations in order to obtain in-depth practical experience. The placement should provide on-the-job practical training for career preparation or advancement. Prior approval must be obtained from the associate dean for international and comparative legal studies. No academic credit is given for this course.

696 Graduate Independent Legal Writing (1 or 2) Staff
Preparation of a research paper under the supervision of a member of the faculty who will determine, prior to registration, whether the work required for the topic justifies 1 or 2 credit hours. Limited to graduate students with at least a *B* average who have had a seminar or comparable course in the field of proposed research. Students are responsible for obtaining an adviser from the full- or part-time faculty who is willing to sponsor their research. Approval by the faculty supervisor is required prior to registration; if the faculty supervisor is a member of the part-time faculty, approval is also required from the senior associate dean for academic affairs or associate dean for academic affairs. Work must be completed within the semester. Students may repeat this course once for credit with the approval of the dean of students, but students may not take more than a total

of 2 credits in this course under supervision of part-time faculty members. (Research paper)

697 Graduate Clinical Studies (1, 2, 3, or 4) Staff
Limited to LL.M. candidates. Practical experience in the student's area of specialization or interest. The student may work with a government agency, congressional committee, court, or other such entity performing tasks normally assigned to an attorney. Course approval must be obtained from the student's faculty adviser and/or the dean. Students enrolled in either the Environmental Law or Government Contracts program should refer to Law 468 and Law 510. A maximum of 4 credit hours may be applied toward graduation. Five hours of work per week are required for each credit. This course is graded on a *CR/NC* basis.

698 Dissertation Research (0)
Candidates for the Doctor of Juridical Science degree must register for this course in four consecutive semesters (excluding the summer session), beginning with the semester of matriculation. No academic credit is given for this course.

GW–Oxford International Human Rights Law Program

The courses in this section are available primarily through the Law School's summer program on human rights law, offered in conjunction with the University of Oxford and held on its campus. Selected courses may also be offered at the Law School. In addition to the courses listed below, the GW–Oxford program curriculum offers Law 546, *International Law of Human Rights,* as *Fundamentals of International Human Rights Law* and Law 568, *Human Rights Lawyering.*

820 Human Rights and the International Criminal Process (2)
Examination of the increasingly articulate body of international human rights law addressing the rights of individuals to equitable treatment at the hands of the state, including international standards regarding detention, arrest, bail, search and seizure, punishment, and a range of fair trial rights, such as the right to counsel, the presumption of innocence, and standards of evidence. Special topics include the rights of defendants and the rules of evidence in international tribunals, such as the Yugoslavian War Crimes Tribunal, as well as the impact of international norms in domestic criminal cases. (Examination)

822 Comparative Human Rights Institutions (2)
Examination of the distinctive features of the institutional arrangements for the protection of human rights in the United States and other countries and regions. Emphasis on developments in the European Union, the Organization for Cooperation and Security in Europe, and inter-American and African systems. Topics to be covered include the availability of regional courts for hearing individual cases, documenting human rights violations, and monitoring elections and human rights performance. (Examination)

824 Human Rights and Refugee Law (2)
Examination of the protection of refugees, asylum seekers, and the internally displaced under the UN Refugee Convention and other international instruments, regional accords, and national law. Emphasis is placed on considering the various conceptions of "refugee," defining persecution, and understanding the rights of asylum and nonexpulsion. Regional developments in Europe, Southeast Asia, and Africa are covered. The predicament of populations at risk, especially women and victims of war or conflict, is discussed. The consequences for the human rights of forced migrants of humanitarian intervention, safe havens, and economic sanctions are analyzed. (Examination and class participation)

826 Human Rights in the Marketplace (2)
The impact of international human rights standards on global trade, corporate governance and competition, international finance, and economic development. Basic principles and institutions; market-based initiatives toward corporate responsibility (i.e., efforts by companies to attract consumers and investors by voluntarily adopting human rights codes of conduct or social accountability standards); domestic regulation (directives and legislation in various countries that, through human rights conditionality, attempt to recruit the transnational corporation as an instrument of foreign policy); civil liability (the enforcement of standards

against corporations through private lawsuits in domestic courts); and international regulation (under which intergovernmental organizations attempt to channel corporate conduct in ways that are thought to be socially responsible). (Examination)

828 International Rights of Women (2) Pirnia, Vollendorf
Examination of the international legal regime for the guarantee of women's rights and why it has been inadequate for the protection of women. Topics include the evolution of the conventions of the rights and protection of women; gender-specific violence as a violation of human rights; cultural variation and the treatment of women and development; and the risks faced by women refugees. Consideration is given to the relationship between feminist theory and human rights law. (Examination)

830 Human Rights Advocacy and Dissemination (2)
This course offers students the opportunity to develop skills in human rights advocacy and dissemination. Through the use of simulation exercises, such as the preparation of petitions to regional and international human rights bodies, country condition reports in support of litigation in national courts, and applications for refugee status, students engage in critical analysis of the methods and strategies for human rights advocacy at the local, national, regional, and international levels. Emphasis is also placed on the training of officials in human rights standards and the dissemination of such information to the general public. Students who receive credit for Law 570 may not enroll in this course. (Simulation exercises and class participation)

832 Rights of Minorities, Groups, and Indigenous Peoples (2)
The legal instruments that protect the rights of minorities, groups, and indigenous peoples, and the jurisprudential bases of those instruments. Emphasis on the legal issues that arise under treaties and customary international law as ethnicity gains importance in post–Cold-War politics and in the workings of international organizations. Jurisprudential approaches to the rights of persons and groups, including natural law, liberal individualism, and communitarianism. Exploration of the question of whether modern representative democracies are capable of protecting minorities and cultural variation. (Examination)

834 Humanitarian Law and Populations at Risk (2)
Study of the evolution of the laws of war from the seventeenth century through the Geneva Conventions and the war crimes jurisprudence of the late twentieth century, with primary emphasis on populations at risk in times of war, including civilians and prisoners of war. Examination of the application of customary and conventional law principles to current conflicts, e.g., the former Yugoslavia, Somalia, and Iraq. Emphasis on the extent to which humanitarian law constrains the actions of international actors, including the United Nations, NATO, and the European Union, in their various peace-keeping functions. (Examination)

836 Human Rights and Military Responses to Terrorism (2)
Examination of international human rights issues that arise when governments use military force, instead of traditional civilian law enforcement methods, to respond to terrorism or the threat of terrorism. Topics include definitions of terrorism and military force; basic authority of governments to use military force against suspected terrorists; and human rights questions posed by military actions such as surveillance of civilian populations to detect terrorist activity, targeted killings and destruction of property of suspected terrorists, and the detention, interrogation, trial, and other punishment of persons accused of terrorism. Consideration of the duty of governments to use military force to provide security against terrorism and the rights of persons injured by military responses to terrorism to receive compensation. (Examination)

838 Protection of Human Rights in Conflict and Post-Conflict Situations (2)
The international legal regime applicable during times of armed conflict. Protection and promotion of international human rights law in post-conflict situations, with emphasis on the role of United Nations peacekeeping operations. (Examination)

839 Advanced Seminar in Human Rights (2)
Selected topics in the theory and practice of human rights law to be announced at the time of registration. Enrollment is limited. May be repeated for credit if topic differs. Prerequisite: Law 520 or permission of instructor. (Research paper)

Munich Intellectual Property Summer Program

The courses in this section are offered through the Law School's summer program in intellectual property law held in Munich, Germany.

840 Cross-Border Trade in Intellectual Property (1)
Issues raised by international trade in goods protected by copyright, patent, or trademark law, and the response of the United States, the European Union, and other legal systems to those issues. Exploration of various doctrines that regulate the importation of goods protected by intellectual property rights, such as those forbidding parallel importation and those dealing with the first-sale doctrine and exhaustion of intellectual property rights. The economic and social policy considerations underlying these doctrines. (Examination)

841 International Patent Law (1)
Introduction to the techniques of international patent regulation and consideration of the effects and desirability of such regulation. International agreements concerning patents, including the Paris Convention, the Patent Cooperation Treaty, the European Patent Convention, and the Trade Related Aspects of Intellectual Property (TRIPs) Agreement. GW degree candidates may not receive credit for both Law 841 and 490. (Examination)

842 Internet Law I (1)
Focus on speech on the Internet, including governmental attempts to control or filter speech, intermediary liability for third-party speech, digital rights management and other copyright issues, and domain names as speech. The rules and institutions that permit or disallow governance of these issues. GW degree candidates may not receive credit for both Law 842 and 485. (Examination)

843 Internet Law II (1)
Focus on e-commerce, including copyright and trademark issues such as framing, linking, and metatags; privacy rights and the database debates; trespass and related theories of property rights; and contracting on the Internet. Computer crime and governmental attempts to regulate cyberspace like other "places," such as through zoning and accessibility laws. GW degree candidates may not receive credit for both Law 843 and 485. (Examination)

844 Patents, Technology, and Society (1)
Social policy issues such as encouragement of innovation and dissemination of information in relation to patent protection. Topics include differing attitudes in the United States and in the European Union and developing countries to the expansion of patent coverage. Although previous technical or patent law training is not required, some previous study of intellectual property or innovation policy is strongly recommended. (Writing assignments)

845 Technical Protection of Authors' Rights (1)
Technologies used to protect authors' rights (such as encryption, flags, degradation schemes, and watermarking) and the law that protects and regulates them, including the U.S. Digital Millennium Copyright Act, the European Copyright Directive, the World Intellectual Property Organization (WIPO) Copyright Treaty, and the WIPO Performance and Phonograms Treaty. Consideration of the impact of these technologies. (Examination)

846 Theoretical Foundations of Intellectual Property (1)
Selected themes in the history and theory of intellectual property, including economic rationales for intellectual property rights, the debate over the limits to intellectual property protection from the 18th through the 20th centuries, and historical accounts of the intellectual property system. (Writing assignment)

847 Intellectual Property and Indigenous Heritage (1)
Conflicts of customary law claims of indigenous peoples with industries operating under Western intellectual property systems over the use of natural resources, traditional knowledge, and folklore. National and regional legislation and efforts to develop international norms and standards. (Examination)

848 Technology Licensing in the European Community (1)
Legal issues arising from technology licensing in the European Community, including antitrust considerations in the framework of Art. 81 of the EC Treaty and the legal means of securing and enforcing technology license contracts. The Technology Transfer Block Exemption Regulation (EC) No. 139/2004 and the secured transactions laws of England and Germany. (Examination)

Alphabetical List of Courses

Courses offered through the Munich Intellectual Property Summer Program are marked with an asterisk. Courses offered through the GW–Oxford Summer Program are marked with a dagger.

Entertainment Law (475)
Environmental Crimes (464)
Environmental Crimes Project (465)
Environmental Issues in Business Transactions (452)
Environmental Issues in Energy Law (439)
Environmental Law (430)
Environmental Law Clinic (627)
Environmental Law Enforcement (433)
Environmental Law Seminar (466)
Environmental Legislation Project (467)
Environmental Negotiations (458)
Environmental Planning (456)
Estate Planning (346)
Ethics in Adjudication and Settlement (678)
Evidence (230)
Family, Child, and State (349)
Family Law (348)
Family Law Seminar (352)
The Federal Circuit (477)
Federal Courts (232)
Federal, Criminal, and Appellate Clinic (625)
Federal Facilities Environmental Law Issues (450)
Federal Income Taxation (300)
Federal Indian Law (397)
Feminist Legal Theory (608)
The First Amendment (382)
Food and Drug Law (408)
Foreign Direct Investment (544)
Forensic Science (370)
Formation of Government Contracts (502)
Fundamental Issues in U.S. Law (694)
Gender Discrimination and the Law (392)
Genetics and the Law (616)
Government Contracts (500)
Government Contracts Cost and Pricing (506)
Government Contracts and Environmental Law Seminar (507)
Government Contracts Seminar (509)
Government Lawyering (671)
Graduate Clinical Studies (697)
Graduate Environmental Placement (468)
Graduate Government Contracts Placement (510)
Graduate Independent Legal Writing (696)
Health Care Law (410)
Health Care Law Seminar (411)
Health Law Rights Clinic (631)
Higher Education Law (389)
History of the U.S. Constitution (594)
Housing Rights Law (338)
Human Rights Advocacy and Dissemination (830)†
Human Rights Advocacy Seminar (567)
Human Rights and the International Criminal Process (820)†
Human Rights and Military Responses to Terrorism (836)†
Human Rights and Refugee Law (824)†
Human Rights in Conflict and Post-Conflict Situations (838)†
Human Rights in the Marketplace (826)†
Human Rights Lawyering (568)†
Humanitarian Law and Populations at Risk (834)†
Immigration Clinic (630)
Immigration Law I (538)
Immigration Law II (539)
Independent Legal Writing (656)
Information Privacy Law (486)
Insurance (298)
Intellectual Asset Management (479)
Intellectual Property (470)
Intellectual Property Antitrust Seminar (494)
Intellectual Property and Indigenous Heritage (847)*
Intellectual Property Law Journal (662)
Intellectual Property Law Seminar (496)
Intensive Clinical Placement (638)
International and Comparative Patent Law (490)
International Arbitration (556)
International Banking (542)
International Business Transactions (522)
International Business Transactions Seminar (564)
International Commercial Law (524)
International and Comparative Patent Law (490)
International Copyright Law (473)
International Criminal Law (554)
International Dispute Resolution (682)
International E-Commerce Seminar (525)
International Environmental Law (454)
International Human Rights Clinic (633)
International Judicial Assistance (531)

International Labor Standards and the Global Economy (529)
International Law (520)
International Law of Human Rights (546)
International Law Review (659)
International Litigation (528)
International Negotiations (558)
International Organizations (530)
International Patent Law (841)*
International Project Finance (545)
International Taxation I (312)
International Taxation II (313)
International Law of Territory and Territorial Disputes (551)
International Rights of Women (828)†
International Trade Law (526)
Internet Law I (842)*
Internet Law II (843)*
Introduction to Advocacy (217)
Introduction to Chinese and Japanese Law (541)
Islamic Law (535)
Jurisprudence (590)
Jurisprudence Seminar (592)
Labor and Employment Law Seminar (276)
Labor Law (266)
Land Use Law (332)
Law and Accounting (602)
Law and Anthropology (612)
Law and Criminology (366)
Law and Economics (598)
Law and Literature (606)
Law and Medicine (617)
Law and Psychiatry (614)
Law and Psychology (615)
Law and Rhetoric (654)
Law and the Deaf (636)
Law in Cyberspace (485)
Law of Japan (536)
Law of Privacy (398)
Law of Race and Slavery (596)
Law of Real Estate Financing (334)
Law of Separation of Powers (384)
Law of the European Union (534)
Law of the People's Republic of China (543)
Law of the Sea (550)
Law of War (552)
Law Review (658)
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Lawyers, Lobbying, and the Law (421)
Legal Activism (637)
Legal Drafting (652)
Legal History Seminar (597)
Legal Practicum (695)
Legal Research and Writing (216)
Legislation (416)
Legislative Analysis and Drafting (418)
Licensing of Intellectual Property Rights (478)
Litigation with the Federal Government (240)
Local Government Law (422)
Mediation (646)
Mediation and Alternative Dispute Resolution (676)
Mock Trial Competition (645)
Modern Real Estate Transactions (330)
Moot Court (644)
National Security Law (386)
Natural Resources Law (440)
Negotiation and Conflict Management Systems Design (681)
Negotiations (648)
Nonprofit Organizations: Law and Taxation (314)
Nuclear Nonproliferation Law and Practice (560)
Outside Placement (668)
Outside Placement Tutorial (673)
Partnership Taxation (304)
Patent Appellate Practice (483)
Patent Enforcement (482)
Patent Law (471)
Patent Strategies and Practice (476)
Patents, Technology, and Society (844)*
Pension Law and Taxation (307)
Performance of Government Contracts (503)
Pre-Trial Advocacy (643)
Pre-Trial Practice in Civil Cases (677)
Pre-Trial Practice in Criminal Cases (684)
Prisoners Project (376)
Products Liability (354)
Professional Responsibility and Ethics (218)
Professional Responsibility and Ethics Seminar (593)
Property (208)
Property and Real Estate Seminar (340)
Protection of Human Rights in Conflict and Post-Conflict Situations (383)†
Public Contract Law Journal (661)
Public Interest Lawyering (670)

Public International Law Seminar (562)
Public Justice Advocacy Clinic (622)
Public Law Seminar (426)
Quantitative Analysis for Lawyers (604)
Race, Racism, and American Law (595)
Refugee and Asylum Law (540)
Regional Protection of Human Rights (547)
Regulated Industries (406)
Regulation and Management of Ecosystems (441)
Regulation of Mutual Funds and Investment Advisers (260)
Regulatory Theory and Practice (404)
Remedies (238)
Research and Writing Fellow (666)
Rights of Minorities, Groups, and Indigenous Peoples (832)†
Role of the Federal Prosecutor (363)
Scholarly Writing (664)
Scientific Evidence Seminar (248)
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Securities Law Seminar (264)
Securities Regulation (252)
Sexuality and the Law (394)
Small Business Clinic (621)
Sports Law (295)
State and Local Taxation (316)
Sustainable Regional Growth Seminar (457)
Takeovers and Tender Offers (256)
Tax Policy Seminar (318)
Technical Protection of Author's Rights (845)*
Technology Licensing in the European Community (848)*
Telecommunications Law (414)
Theoretical Foundations of Intellectual Property Law (846)*
Thesis (690–91)
Torts (206)
Toxic Tort Litigation (449)
Trade and Sustainable Development (435)
Trade Remedy Law (563)
Trademark Law and Unfair Competition (474)
Traditional Jewish Civil Law (537)
Transnational Family Law (533)
Trial Advocacy (640)
Trusts and Estates (342)
U.S. Export Control Law and Regulation (553)
U.S. Foreign Relations Law (385)
U.S. Legal History (591)
Vaccine Injury Clinic (626)
Voting Rights Law (387)
Water Pollution Control (434)
Water Resources Law (436)
Wealth Transfer Taxation (306)
White Collar Crime (364)

The University

History and Organization

George Washington was determined to have a great national university in the nation's capital. His hope was that students from all parts of the country would gain a first hand knowledge of the practice as well as the theory of republican government while being instructed in the arts and sciences. He bequeathed 50 shares of The Potomac Company "towards the endowment of a University to be established within the limits of the District of Columbia, under the auspices of the General Government, if that government should incline to extend a fostering hand towards it." Despite Washington's intentions, The Potomac Company folded and Congress never extended a "fostering hand," so the University did not take shape until a group of Baptist clergymen led by Reverend Luther Rice took up the cause. They raised funds for the purchase of a site and petitioned Congress for a charter. Congress insisted on giving the institution a non-sectarian charter which stated "That persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil be refused admittance into said College, or denied any of the privileges, immunities, or advantages thereof, for or on account of his sentiments in matters of religion."

Columbian College, as it was originally named, took up residence on College Hill, a 46-acre tract between the present 14th and 15th Streets extending from Florida Avenue to Columbia Road. The name of the institution was changed in 1873 to Columbian University and in 1904 to The George Washington University.

By 1918, the University had moved to the Foggy Bottom neighborhood—between 19th and 24th Streets, south of Pennsylvania Avenue—in the heart of Washington, D.C. The more than 90 buildings, including 14 residence halls, are situated on 43 acres bordered by the White House, the John F. Kennedy Center for the Performing Arts, the State Department, and the World Bank, as well as numerous federal agencies, national galleries and museums.

GW's Virginia Campus, initiated for graduate studies, research projects, and professional development programs is located along the high-tech corridor on Route 7, just to the west of Route 28, in Loudoun County. GW's Mount Vernon Campus is located on Foxhall Road in Northwest Washington.

Currently, the University's enrollments total more than 24,000, of which over 10,500 are undergraduate students, over 12,000 are graduate and professional students, and about 1,000 are nondegree students. The students come from all 50 states and 130 different countries.

The University as it is now organized consists of Columbian College of Arts and Sciences and the professional schools, which include the Law School, the Elliott School of International Affairs, the Graduate School of Education and Human Development, the College of Professional Studies, and the Schools of Medicine and Health Sciences, Public Health and Health Services, Engineering and Applied Science, and Business.

Academic Status

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Schools. The University is on the approved list of the American Association of University Women and is a member of the College Board.

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The objectives of this association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Membership in the Association is conveyed automatically to anyone who has been graduated from any school or division of the University. Anyone who has earned 15 credit hours or the equivalent at the University, who has left the University in good standing, and whose class has graduated is eligible for membership.

The affairs of the Association are directed by a Governing Board, the majority of whose members represent the constituent alumni organizations of the University's schools. The voluntary leadership of the Association works closely with the staff of the Alumni Relations Office in carrying out Association affairs. The Association may be contacted through the Alumni Relations Office.

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The purpose of The George Washington Law Alumni Association is to engage GW Law alumni in support of the School. By fostering relationships between the Law School and its graduates, the Board's distinguished members play an important role in the life of the School.

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School of Medicine and Health Sciences: Bachelor of Science in Health Sciences (B.S.H.S.), Master of Science in Health Sciences (M.S.H.S.), Master of Science in Nursing (M.S.N.), and Doctor of Medicine (M.D.)

Law School: Juris Doctor (J.D.), Master of Laws (LL.M.), and Doctor of Juridical Science (S.J.D.)

School of Engineering and Applied Science: Bachelor of Science (B.S.), Bachelor of Arts (B.A.), Master of Engineering Management (M.E.M.), Master of Science (M.S.), Engineer (Engr.), Applied Scientist (App.Sc.), and Doctor of Science (D.Sc.)

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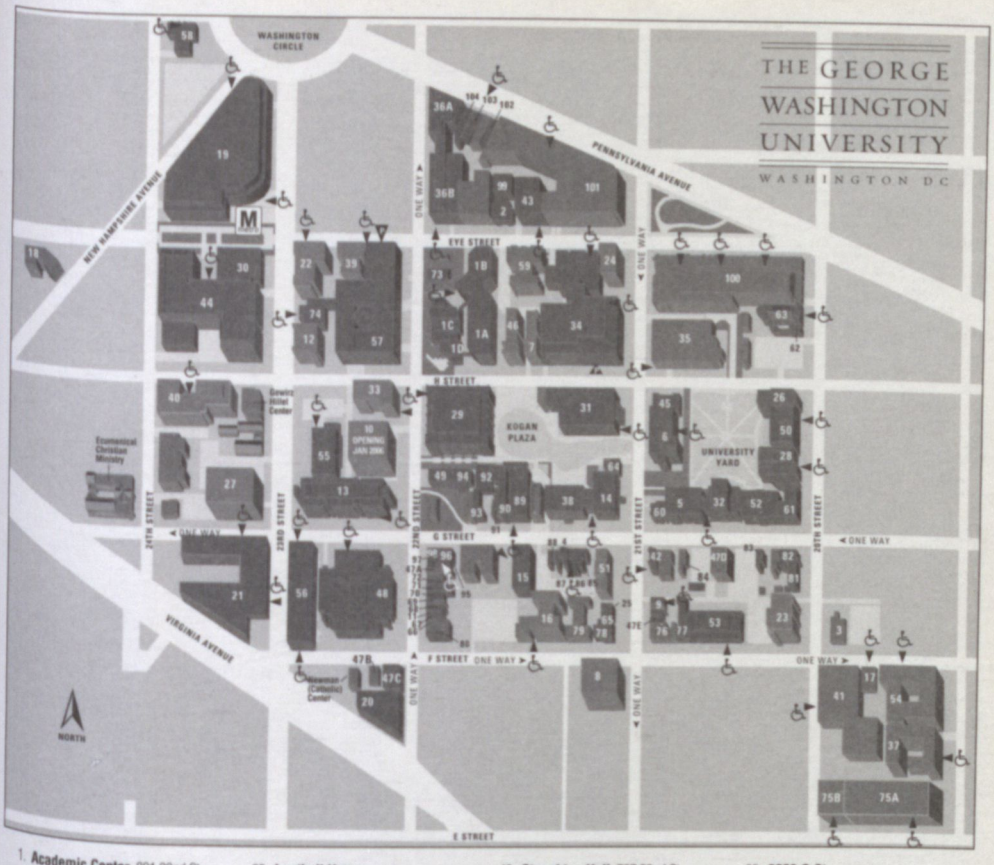
College of Professional Studies: Associate in Professional Studies (A.P.S.), Bachelor of Professional Studies (B.P.S.), and Master of Professional Studies (M.P.S.)



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